NASA

Management
A Continuing Bibliography with Indexes

NASA SP-7500 (14)
March 1980

National Aeronautics and Space Administration

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NASA SP-7500(14)

MANAGEMENT

A CONTINUING BIBLIOGRAPHY

– With Indexes –

A selection of annotated references to unclassfied reports and journal articles that were introduced into the NASA Scientific and Technical Information System during 1979.

NASA Scientific and Technical Information Branch 1980
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INTRODUCTION

COVERAGE

Management is a compilation of references to selected reports, journal articles, and other documents on the subject of management. This publication lists 604 documents originally announced in the 1979 issues of *Scientific and Technical Aerospace Reports (STAR)* or *International Aerospace Abstracts (IAA).*

SCOPE

This publication series includes references on the management of: research and development, contracts, production, logistics, personnel, safety, reliability and quality control. It also includes references on: program, project and systems management; management policy, philosophy, tools, and techniques; decisionmaking processes for managers; technology assessment; management of urban problems; and information for managers on Federal resources, expenditures, financing, and budgeting.

ORGANIZATION

Each entry in this bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two sections: *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Following the abstract sections, three indexes are included; subject, personal author, and corporate source.

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All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies of accessions are available at $7.00 per document up to a maximum of 40 pages. The charge for each additional page is $0.25. Microfiche[1] of documents announced in *IAA* are available at the rate of $3.00 per microfiche on demand, and at the rate of $1.25 per microfiche for standing orders for all *IAA* microfiche. The price for the *IAA* microfiche by category is available at the rate of $1.50 per microfiche plus a $1.00 service charge per category per issue. Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of $1.50 per microfiche.

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All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR* Entries or *IAA* Entries. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publications inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

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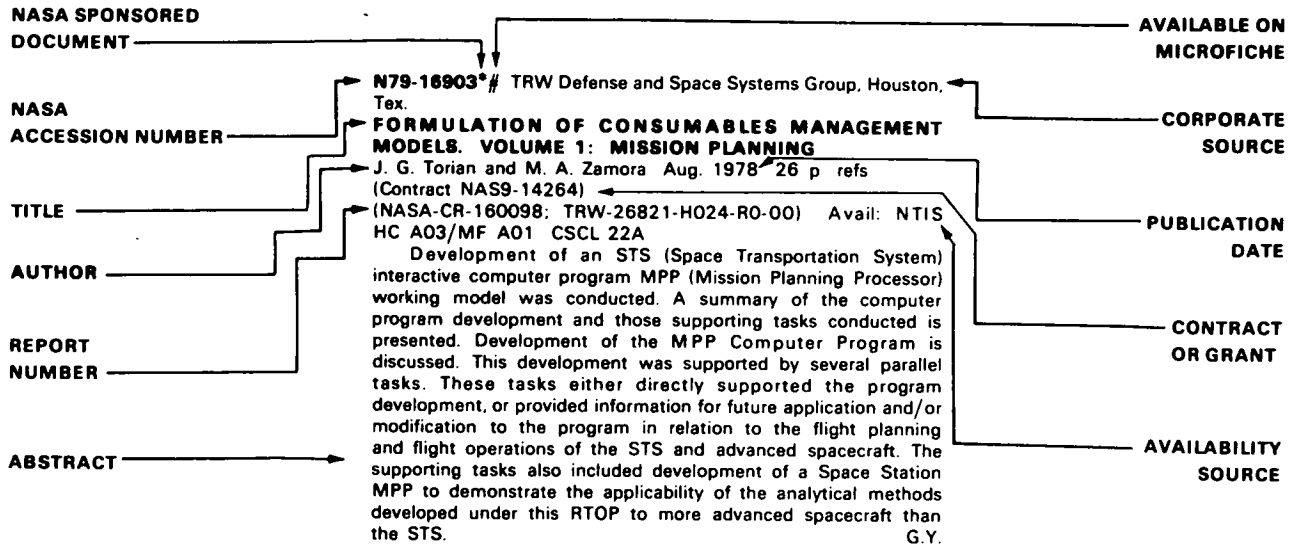

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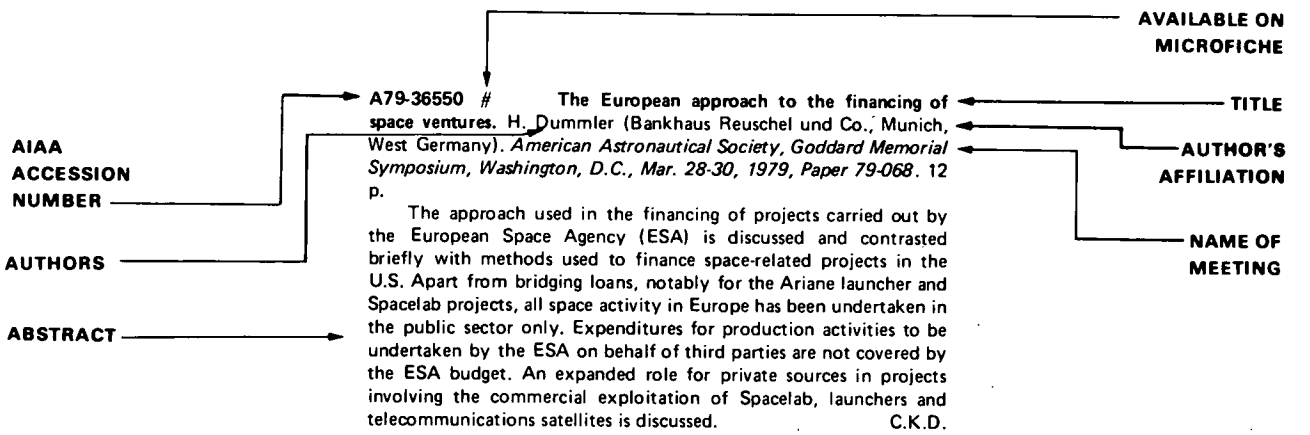

MANAGEMENT

A Continuing Bibliography

MARCH 1980

IAA ENTRIES

A79-10406 Overview of the small package air carrier industry - A study of the operations in Federal Express. Y. Chan (Pennsylvania State University, University Park, Pa.) and R. J. Ponder (Federal Express Corp., Memphis, Tenn.). *Society of Automotive Engineers, Air Transportation Meeting, Boston, Mass., May 1-4, 1978, Paper 780540.* 12 p. 7 refs.

A79-10755 # Finance for telecommunications in the space age. J. L. Blonstein (EUROSPACE, Paris, France). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Space Symposium, 15th, Bremen, West Germany, June 8, 9, 1978, Paper 78-047.* 14 p.

The paper discusses the main possible sources of financial support for the development of space telecommunications. The six prime sources discussed are (1) the European Investment Bank, (2) national investment banks such as the British Commonwealth Development Corporation, (3) national banks, (4) the bonds and private investment markets, (5) national export financing, and (6) the Euromarkets. Criteria that should be met by an organization seeking funds for a new operation are discussed. These include the use of proven technology, project flexibility, experienced management, good credit of suppliers and users, and the existence of alternative markets for the service. P.T.H.

A79-10872 ACS.1 - An experimental Automated Command Support system. M. C. Pease, III (Stanford Research Institute, Menlo Park, Calif.). *IEEE Transactions on Systems, Man, and Cybernetics,* vol. SMC-8, Oct. 1978, p. 725-735. 9 refs. Navy-supported research.

The paper describes an operating laboratory system developed as part of a research program on methods to provide automated support for high-level management. The system is called Automated Command Support (ACS.1), and operates in the context of the command environment of a naval air squardon. The main blocks of the system are the message handler, the planner, and the scheduler. The planner's knowledge about a certain activity is in the form of a process model containing constraints in declarative form that can be easily understood. The scheduler makes use of a scroll table to maintain the data he needs. The table scroll lists the resources in columns and times in rows. It is supplemented by the resource model. The procedural forms are called 'demons', which are structures containing a condition and a function. To execute operations, a demon is attached to entries describing an assignment. P.T.H.

A79-11335 Cost reduction - An Ariane production phase objective. R. Charre. *International Astronautical Federation, International Astronautical Congress, 29th, Dubrovnik, Yugoslavia, Oct. 1-8, 1978, Paper 78-A-25.* 21 p.

The history, planning, and production of the Ariane launch vehicle are surveyed, and a program for reducing costs is discussed. The CNES policy involves intensification of cost-price accounting investigations, the introduction of a price-reduction factor, and the promotion of incentive clauses in the contracts. It is noted that the Ariane project is the first production program directed by the French CNES and that, while the imperatives of the Ariane development phase were of a political and technical nature, the imperatives for the production phase are primarily economic. Reasons for the use of the value analysis technique are considered, and some conclusions are presented. M.L.

A79-11476 Winter Simulation Conference, Gaithersburg, Md., December 5-7, 1977, Proceedings. Volumes 1 & 2. Conference sponsored by SCS, NBS, ACM, ORSA, TIMS, AIEE, and IEEE. Edited by H. J. Highland (New York, State University, Farmingdale, N.Y.), R. G. Sargent (Syracuse University, Syracuse, N.Y.), and J. W. Schmidt (Virginia Polytechnic Institute and State University, Blacksburg, Va.). New York, Institute of Electrical and Electronics Engineers, Inc., 1977. Vol. 1, 478 p; vol. 2, 432 p. Price of two volumes, $40.

The topics considered are related to the random variate generation for simulation, the selection of alternatives through simulation, system optimization through simulation, statistical methodology, simulation methodology, production planning and control, energy systems, government systems, criminal justice systems, models and planning, environmental and ecological systems, health care systems, and behavioral systems. Attention is also given to military systems, digital gaming, agricultural systems, network models, simulation languages, financial and corporation modeling, business systems, computer system models, corporate planning modeling languages, transportation systems, simulation supported computer system design, modeling support and analysis systems, questions of simulation documentation, applications of simulation, manufacturing systems, combined simulation applications, a study of rolling-mill productivity utilizing a statistical designed simulation experiment, and a model for simulating combat medical support systems. G.R.

A79-11477 An analysis of the effect of production quantity and inventory selection policy on the probability of meeting a specified launch schedule. V. A. Zaloom (Auburn University, Auburn, Ala.). In: Winter Simulation Conference, Gaithersburg, Md., December 5-7, 1977, Proceedings. Volume 1.
New York, Institute of Electrical and Electronics Engineers, Inc., 1977, p. 196-201.

The major objective of the Space Shuttle Program is to achieve a low cost per flight for space operations while providing a capability to support a variety of scientific, defense, and commercial applications. One aspect of cost per flight is related to the number of new motors required. It is shown that the number of new units required to achieve a given probability of meeting the launch schedule is smaller if the newest available motor is selected as opposed to the oldest available motor. A brief description is presented of the Logistics Simulation Model. This model is a FORTRAN program which simulates the flow of hardware. New motors enter the

inventory of available units according to a user defined production schedule. Upon recovery spent motors are refurbished and returned to the available inventory. It is found that production quantity and inventory selection policy can be optimized to achieve low cost per flight while assuring a specified probability of meeting a launch schedule. G.R.

A79-12301 **AUTOTESTCON '77; Symposium, Hyannis, Mass., November 2-4, 1977, Record.** Symposium sponsored by the Institute of Electrical and Electronics Engineers. New York, Institute of Electrical and Electronics Engineers, Inc., 1977. 293 p. Members, $15.; nonmembers, $20.

Consideration is given to such areas as BITE impact on prime systems, the impact of advancing technology on ATE, vehicle and display testing, international developments in ATE, ATE mechanical and operator interface design, automatic test program generation, and ATE test program management. Particular papers are presented on the harmonization of prime equipment BITE with ATE test capability, ATE support systems for advanced avionics, testing of avionics display systems, automated operator manual for automatic test systems, and measurements of testability for analog systems. B.J.

A79-12319 **Management of test program development for S-3A.** J. M. Colebank, V. J. Peterson, and D. A. Farr (Lockheed-California Co., Burbank, Calif.). In: AUTOTESTCON '77; Symposium, Hyannis, Mass., November 2-4, 1977, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1977, p. 246-253. 5 refs.

The S-3A Viking antisubmarine warfare aircraft is described in terms of the avionics system, maintainability, and automatic test equipment. The management program is considered with reference to the planning, design, programming, debugging, and design acceptance phases. The organizational aspects of management are also assessed including test programming, systems engineering, hardware, engineering services, quality testing, and customer relations. S.C.S.

A79-12321 **F-16 LRU test programs - A systems approach.** P. D. O'Connor (USAF, F-16 System Program Office, Wright-Patterson AFB, Ohio). In: AUTOTESTCON '77; Symposium, Hyannis, Mass., November 2-4, 1977, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1977, p. 270-278.

The paper outlines the management approach planned and initiated by the F-16 System Program Office to address the problems associated with system test specifications and line-replaceable-unit test program source documentation in the early development phases of the F-16 avionics intermediate shop program. The approach is based on innovative contractual concepts, early in-depth planning, and meticulous execution of a detailed game plan. Initial results are presented, and suggested changes to acquisition strategy are discussed. S.D.

A79-12957 # **Dynamic model of an industrial plant manufacturing a variety of products (Dinamicheskaia model' mnogoproduktovogo proizvodstvennogo ob'ekta).** M. M. Rafikov and T. K. Sirazetdinov. *Aviatsionnaia Tekhnika*, vol. 21, no. 2, 1978, p. 74-82. In Russian.

A mathematical model, consisting of a system of differential and algebraic equations and inequalities, is proposed for an industrial plant. The production process is treated in terms of three different but related factors: the resources and means of production; materials and power consumption; and the labor force. Each of these factors is analyzed, and equations describing the development and status of each factor are derived. The interaction of the three factors is examined, and the conditions reflecting the constraints on production are formulated. The application of the model is illustrated by an example. V.P.

A79-13001 **Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings (Die Produkthaftung in der Luft- und Raumfahrt; Internationales Kolloquium, Cologne, West Germany, March 31-April 2, 1977, Proceedings).** Conference sponsored by the Universität zu Köln, Deutsche Gesellschaft für Luft- und Raumfahrt, and International Law Association. Edited by K.-H. Böckstiegel (Köln, Universität, Cologne, West Germany). Cologne, West Germany, Carl Heymanns Verlag (Internationales Wirtschaftsrecht. Volume 1), 1978. 319 p. In German and English. $53.35.

The present state of product liability in general de lege lata and de lege ferenda is examined, taking into account the present state of the law in the Federal Republic of Germany and in Europe from the standpoint of the government and of the consumer, the status of product liability de lege lata and de lege ferenda in the Federal Republic of Germany and in Europe as seen by industry, and insurance law and product liability. The special aspects of product liability in relation to air and space transportation are considered, giving attention to the right of passengers according to a view from the U.S., the present state of the law in the U.S. from the standpoint of industry, perspectives of product liability as developed by the U.S. Federal Interagency Study, the present state of the law in the Federal Republic of Germany and in Europe, aspects of insurance law, product liability and the use disclaimer clauses by aircraft manufacturers, and special aspects of product liability in relation to space transportation. Product liability in the present and future liability system of international air transportation is also discussed. G.R.

A79-13002 # **The present state of the law in the Federal Republic of Germany and in Europe from the standpoint of the government and of the consumer (Der Stand in der Bundesrepublik und in Europa aus der Sicht des Staates und des Verbrauchers).** M. Röbbert (Bundesminister der Justiz, Bonn, West Germany). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 15-28. In German.

Aspects of liability in the case of damage produced as a consequence of the defects of a product are examined, taking into account the significance of the origin and the cause of the defect. Basic differences exist between cases in which the occurrence of the defect is the fault of the manufacturer and defects which are related to development risks. According to the current state of the law, the plaintiff has to present the facts upon which the claim is to be based and, if necessary, has to present proof concerning these facts. Legal developments regarding the considered questions are discussed. A decisive improvement of the injured person's position was brought about by the principles developed by the courts in their practice and regarding the distribution of the burden of proof. According to these principles it is the producer, at least in big and medium-sized enterprises, on whom the burden of proof rests to show that in cases where damage was caused by a defective product there was no blameworthy fault on the part of the producer or his servants. G.R.

A79-13003 # **The status of product liability de lege lata and de lege ferenda in the Federal Republic of Germany and in Europe as seen by industry.** H.-V. von Hülsen (Volkswagenwerk AG, Wolfsburg, West Germany). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 29-53. 85 refs.

Approaches to be used in the field of private civil liability in connection with damages caused by defective products are considered. An investigation is conducted to find out whether a proposed directive related to such approaches will help to achieve a number of political and economical targets found to be desirable in this connection. These targets are to provide for the best possible reparation of damages, combined with the best possible incentive to

prevent accidents, at lowest costs to the national economy avoiding other negative impacts. The current status of the law with respect to product liability cases is illustrated with the aid of examples, related to the failure of a spot weld contained in the frame of a new motorcycle, the sudden disintegration of a tire designed for high speed, and adverse affects of a tranquilizing drug. It is pointed out that the considered draft directive would bring about dramatic changes with respect to three of the four major elements of product liability law suits. It is found that the desired objectives are not obtained by the draft directive. To the contrary the severe economic dangers of obstructing technical progress and impairing the competitiveness are created. G.R.

A79-13004 # **Insurance law and product liability.** E. Klingmüller (Köln, Universität, Cologne, West Germany). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 55-67. 55 refs.

There are two approaches to claims involving employer's liability. First of all there is the growing number of cases based on warranties and guarantees. Secondly, there are the claims based on delict, i.e. tort and negligence, where there is a presumption of fault with a reversed burden of proof. Germany has elected to take the second course. The German law of delict is based on an infringement of actual, absolute rights, so that mere pecuniary losses are largely excluded. Section 50 of the German Aviation Act lays down that, where damage arises from the operation of an aircraft, it is the owner or the user or the pilot or another person who is liable. This means that, in spite of the airline's limited liability, the aircraft producer himself may be liable, where the loss, i.e., the accident, can be attributed to some defective piece of equipment. As far as the adjustment of claims and general cover in the aviation field is concerned, German law allows airlines to cover the liability risk in respect of personal injury, by taking out a fixed-sum policy. G.R.

A79-13007 # **The present state of the law in the United States from the standpoint of industry. II.** J. P. Coie (Boeing Co., Seattle, Wash.). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 109-124. 50 refs.

It is pointed out that the field of manufacturer's product liability has undergone dramatic changes in the past few decades in the U.S. These changes reflect an evolving social and economic philosophy that focuses on the plight of the 'average' consumer of the product rather than the fault or absence of fault on the part of the manufacturer. The three theories of recovery available to a consumer who is injured by a defective product are related to negligence, strict liability in tort, and breach of warranty. A brief outline is presented of the legal requisites for each of these theories. The types of plaintiffs encountered by aircraft manufacturers as a result of an aircraft accident or incident include the passenger in an accident aircraft suing for injury or death, the purchaser of the aircraft suing for damage to the aircraft, damage to other property, or loss of use of the aircraft, and the flight crew of the aircraft suing for injury or death. Each of these cases involves certain distinct issues which are discussed. G.R.

A79-13008 # **Perspectives of product liability as developed by the Federal Interagency study.** V. E. Schwartz. In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 125-131.

In response to reports of a number of corporations, particularly small businesses, to the White House in Washington, D.C. regarding their inability to obtain product liability insurance at rates which they could afford, an investigation of this problem was conducted. The investigation included an industry study carried out by independent contractors. It was found that from 1974 to 1976, product liability premiums for certain industries rose substantially. In the area of consumer goods, the pharmaceutical and automobile component part industries showed a much more substantial rise in insurance rates than the aircraft components industry. It was found that the increased cost of product liability insurance affected small business much more severely than larger ones, sometimes 4 or 5 times as much. It was also found that the cost of product liability insurance, on the average, represented no more than 1% of sales. For some smaller industries, especially in the industrial machinery area, it was more. G.R.

A79-13009 # **The present state of the law in the Federal Republic of Germany and in Europe (Der gegenwärtige Stand in der Bundesrepublik und in Europa).** W. Petermann (Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, West Germany). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 133-139, 141. In German.

It is pointed out that in connection with the use of European aerospace products outside of Europe the attitude of the European aerospace industry with respect to product liability must be based on international liability considerations. The European aerospace industry recognizes, therefore, a liability to customers and third parties in connection with damage caused by defective products. It feels disturbed in connection with an escalation of product liability claims in the U.S., because this escalation has its effect also on the European economy. Firms with government participation are in this respect in a better position than the private industry. Problems for Europe as well as for the U.S. are related to the discrepancy between the increase in the monetary awards and the economic position of the aerospace industry. Two approaches for solving these problems are discussed. G.R.

A79-13011 # **Product liability and the use of disclaimer clauses by aircraft manufacturers.** H. DeSaussure (Akron, University, Akron, Ohio). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 157-164. 36 refs.

Strict liability is a doctrine which provides an effective incentive to manufacturers to make their products as safe as possible. The question is in this connection considered whether it is in the public interest to permit aircraft manufacturers to shield their liability for their product or for their own negligence by contractual disclaimer. Exculpatory clauses are frequently used by manufacturers to limit or exclude liability to their immediate vendee for a defective product. The courts have fashioned several basic rules to determine whether such clauses will be upheld. Such exculpatory provisions will be strictly construed against the party relying on them. The clause will not be allowed to stand where the two parties are of disparate bargaining strength. Any contractual disclaimers which contravene public policy will be voided. In a well known 1967 California case, in which a new aircraft of U.S. airline was involved, the trial court ruled that the exculpatory clause of the aircraft manufacturer was void as against public policy and the jury returned a verdict for the airline for an amount approachihg a quarter of a million dollars. G.R.

A79-13012 # **Special aspects of products liability in relation to space transportation.** I. H. P. Diederiks-Verschoor (International Institute of Space Law, Paris, France). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings.
Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 165-179. 26 refs.

General observations on products liability in relation to space transportation are presented. According to Drion (1969), products liability not only includes the classical form of contractual liability as for example where the buyer complains about a delivered object, but also the liability toward third parties, suffering from damage caused by defects in products that have been put into circulation by someone with whom they do not have contractual relations. The concept of products liability in space transportation is discussed along with the manufacturers liability for damage caused by space activities, giving attention to states, international intergovernmental organizations, joint ventures of states, and private enterprises. The Treaty of 1967 on Principles governing the Activities of States in the Exploration and Use of Outer Space is considered along with the Convention on International Liability for Damage caused by Space Objects of 1973. The question is considered whether the Convention drafted by The Hague Conference on Private International Law could be applied to products regarding space transportation. G.R.

A79-13013 # **Special aspects of product liability in relation to space transportation.** N. M. Matte (McGill University, Montreal, Canada). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 181-195. 93 refs.

A definition of product liability as applied to space transportation is considered. Under a regime of strict liability most often the operator or the owner is responsible, especially for damages caused by a hazardous or extrahazardous source. The state sponsoring such activities may in certain specified cases, be the party liable on the international level, as for example in the case of damage caused by spacecraft, under the Convention on International Liability for Damage Caused by Space Objects of 1972. The term 'space objects' is used so as to include not only spacecraft as a whole, but also component parts of a space object as well as its launch vehicle and parts thereof. If the notion of product reliability is applied with these ramifications to space transportation, the special aspects of the products involved have to be taken into account. Attention is given to questions concerning the law which is applicable in this case, the emerging international law on product liability, the municipal law of product liability, the liability of the manufacturer within contractual relations, and delictual aspects of product liability. G.R.

A79-13015 # **The disarray and necessary renewal of the international liability system in air transportation. I.** R. H. Mankiewicz (International Law Association, London, England). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 219-250. 167 refs.

An investigation is conducted concerning the causes and specific aspects of the disarray of international aviation liability rules, taking into account the dismantling of the Warsaw rules on air carriers' liability and other causes of the disarray in aviation liability. Attention is given to the erosion of the uniform Warsaw rules by international legislators, the impact of national laws giving effect to the Warsaw regime, aspects of disunification by national regulation, genetic defects leading to judicial disorder, linguistic causes of disunity, cases of distortion of the uniform law by the effect of differing judicial traditions and precedents, some instances of judicial 'disunification' through divers construction of rules drafted in clear and unambiguous language, the missing convention on aircraft collision, the failure of the 1952 Rome Convention, and products liability. A new approach to the problem of liability in air transportation is presented. G.R.

A79-13016 # **The disarray and necessary renewal of the international liability system in air transportation. II.** J. Rajski (Warszawa, Uniwersytet, Warsaw, Poland). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 251-255.

The development of air transportation which occurred during the last decades has been achieved to a certain extent within the legal framework established in the Convention for the Unification of Certain Rules Relating to International Carriage by Air signed in Warsaw on 12 October, 1929. The basic principles upon which the international air carrier's liability as established by the Warsaw Convention in 1929 was founded had to take into account air transport conditions as they existed at that time. It has been attempted various times to adjust the employed approaches to the changing situation in air transportation. A rescue action tried in 1955 during The Hague Conference was not very successful. The Hague Protocol was followed by the adoption of the Convention Supplementary to the Warsaw Convention for the Unification of Certain Rules Relating to International Carriage by Air Performed by a Person Other than the Contracting Carrier signed at Guadalajara on 18 September, 1961. Attention is also given to the Montreal Agreement of 4 May 1966, the Guatemala City Conference in 1971, and the Montreal Conference of 1975. G.R.

A79-13017 # **The development of product liability as a reason and a chance for the renewal of the international liability system in air transportation (Die Entwicklung der Produkthaftung als Grund und als Chance für die Novellierung des internationalen Haftungssystems der Luftfahrt).** K.-H. Böckstiegel (Köln, Universität, Cologne, West Germany). In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 257-272. 101 refs. In German.

An unsatisfactory current status of the aviation product liability law is considered. Suitable approaches for improving the current status are discussed, taking into account the special aspects of product liability in the case of aerospace applications, the consideration of product liability according to the Warsaw Convention, the liability against third parties on the ground, liability in the case of space activities, and aerospace liability problems not directly related to product liability. An investigation is conducted regarding the problems and criteria concerning a coordination or integration of product liability approaches. Suitable objects for a universal coordination are discussed. The feasibility of a universal coordination will depend largely on the possibility to find a common denominator for the approaches used in the U.S. and in the other countries. G.R.

A79-13019 # **Proposal for a Council Directive relating to the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products.** In: Product liability in air and space transportation; International Conference, Cologne, West Germany, March 31-April 2, 1977, Proceedings. Cologne, West Germany, Carl Heymanns Verlag, 1978, p. 307-312.

A79-13181 Human Factors Society, Annual Meeting, 21st, San Francisco, Calif., October 17-20, 1977, Proceedings. Edited by A. S. Neal and R. F. Palasek. Santa Monica, Calif., Human Factors Society, Inc., 1977. 579 p. Members, $15.; nonmembers, $20.

The proceedings deal with various aspects of human factors as a discipline contributing to the technology of tomorrow. Human factors are discussed relative to task design, human performance and related subjects. Attention is given to computer applications to instructional technology, human information processing, human performance modeling, equipment design, visual performance, psychomotor performance, environmental stress, display systems, and applications in diagnostic and therapeutic clinical electrophysiology. S.D.

A79-13218 * **NASA flight management research.** J. I. Laveson (NASA, Washington, D.C.). In: Human Factors Society, Annual Meeting, 21st, San Francisco, Calif., October 17-20, 1977, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1977, p. 411-415. 6 refs.

The NASA Flight Management Research Program is committed to better understanding the aircrew role and human-system interface requirements within the air transportation system. Tradition pilot roles have been supplemented by the flight management concept where crew members become decision makers and monitors of aircraft status. The aircrew is viewed as skilled human operators in a complex environment. In a systems context, work is under way to better understand the theoretical basis for human performance. Applied efforts are aimed at investigating current and future problems which crews face as flight managers. Research areas include control-display development and evaluation; procedures for effective crew-system interface; and alternative, nonvisual communication techniques. These areas are investigated in laboratory, part-task simulation and full mission simulation studies. (Author)

A79-13219 * **Coordinated crew performance in commercial aircraft operations.** M. R. Murphy (NASA, Ames Research Center, Moffett Field, Calif.). In: Human Factors Society, Annual Meeting, 21st, San Francisco, Calif., October 17-20, 1977, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1977, p. 416-420. 22 refs.

A specific methodology is proposed for an improved system of coding and analyzing crew member interaction. The complexity and lack of precision of many crew and task variables suggest the usefulness of fuzzy linguistic techniques for modeling and computer simulation of the crew performance process. Other research methodologies and concepts that have promise for increasing the effectiveness of research on crew performance are identified. B.J.

A79-13298 Structural optimization and the optimization of the design process (Strukturoptimierung und Optimierung des Entwurfsprozesses). R. Zimmermann (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Strukturmechanik, Braunschweig, West Germany). *Zeitschrift für Flugwissenschaften und Weltraumforschung,* vol. 2, Sept.-Oct. 1978, p. 321-329. 12 refs. In German.

The procedures which the field of structure optimization has made available to the design engineer are regarded with great scepticism by the potential user. The reported investigation is concerned with an evaluation of the validity of this scepticism. The approaches of structure optimization are derived systematically as part of the optimization of the design process. It is shown that the attempt to optimize a complex structure of a realistic size in a single fully automatic process is not desirable because such a procedure frequently does not satisfy requirements regarding process economy and reliability. Proven methods for dividing the process into several parts are available. The dialog between design engineer and the automaton can be a reliable alternative to a fully automatic process. There are, however, limits concerning the division of the process. The main objective of research in the area of structure optimization is, therefore, related to the task to develop problem-oriented procedures and to quantify the requirements of practical implementation correspondingly. In this process, increasing use should be made of the interactive dialog. G.R.

A79-13301 NTC '77; National Telecommunications Conference, Los Angeles, Calif., December 5-7, 1977, Conference Record. Volumes 1, 2 & 3. Conference sponsored by the Institute of Electrical and Electronics Engineers. New York, Institute of Electrical and Electronics Engineers, Inc., 1977. Vol. 1, 442 p.; vol. 2, 462 p.; vol. 3, 490 p. Price of three volumes, members, $34.50; nonmembers, $46.

The papers deal with equipment and services in the area of telecommunications, research and development work, implementation, and operations. Some of the sessions and panel discussions are concerned with the social implications of our expanding technology, the cost benefits of network automation, the environment (EMI), and network security with respect to privacy of communication. V.P.

A79-13358 * **A life cycle cost economics model for automation projects with uniformly varying operating costs.** D. S. Remer (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: NTC '77; National Telecommunications Conference, Los Angeles, Calif., December 5-7, 1977, Conference Record. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1977, p. 32:4-1 to 32:4-6. 5 refs. Contract No. NAS7-100.

The described mathematical model calculates life-cycle costs for projects with operating costs increasing or decreasing linearly with time. The cost factors involved in the life-cycle cost are considered, and the errors resulting from the assumption of constant rather than uniformly varying operating costs are examined. Parameters in the study range from 2 to 30 years, for project life; 0 to 15% per year, for interest rate; and 5 to 90% of the initial operating cost, for the operating cost gradient. A numerical example is presented. M.L.

A79-13865 # **Venture analysis of a proposed federal photovoltaic eight-year procurement plan.** D. R. Costello (Solar Energy Research Institute, Golden, Colo.). *American Institute of Aeronautics and Astronautics and Arizona Solar Energy Research Commission, Conference on Solar Energy: Technology Status, Phoenix, Ariz., Nov. 27-29, 1978, AIAA Paper 78-1766.* 6 p. 5 refs.

The paper summarizes a venture analysis of a temporary federal subsidy for the purchase of photovoltaic energy systems by the private sector. The goal of the subsidy was to stimulate markets in order to reduce the price of photovoltaic systems. The study's objective was to determine if the marginal societal benefits of the subsidy (measured by changes in consumer surplus) justified the program's cost. The study used a mixture of analytical approaches and opinion gathering techniques. It was concluded that, under most future economic conditions, the subsidy would not be an effective mechanism to achieve the required photovoltaic system price reductions. The subsidy would yield useful market and performance information. (Author)

A79-13997 # **Control of the effectiveness of scientific activity (Upravlenie effektivnost'iu nauchnoi deiatel'nosti).** G. M. Dobrov, E. M. Zadorozhnyi, and T. I. Shchedrina. Kiev, Izdatel'stvo Naukova Dumka, 1978. 240 p. 140 refs. In Russian.

The book is concerned with problems of increasing the effectiveness of the scientific activity of research institutions as well as with many aspects of research planning. Investigational results are presented, and several tasks for improvement of research-work planning are formulated. Attention is given to advanced methods and ways of establishing the program of research work and experimental-design activity. Also discussed are ways of enhancing the quality and effectiveness of scientific activity by means of a well-established prognosis of scientific strategy, an improved technical-economic basis for research and development, a well-founded evaluation of the effectiveness of research work, and estimation of the activity of research institutions. S.D.

A79-14126 International Air Transportation Conference, Washington, D.C., April 4-6, 1977, Proceedings. Conference sponsored by the ASCE, AOCI, ATAA, AAAE, FAA, and IATA. New York, American Society of Civil Engineers, 1977. 418 p. $16.

The effects of energy shortages, airline deregulation, environmental regulations, and aircraft noise abatement on air transportation and airport design are discussed. Topic categories are financial issues and outlook, impact of regulatory measures, future prospects of aircraft technology, airside and landside considerations, and impact of future technology aircraft on airport facilities. M.L.

A79-14133 **Impact of airline deregulation on airports.** A. J. Huber (Louisville and Jefferson County Air Board, Louisville, Ky.). In: International Air Transportation Conference, Washington, D.C., April 4-6, 1977, Proceedings. New York, American Society of Civil Engineers, 1977, p. 96-103.

Airport financing and airport facility planning are considered with respect to the proposed Aviation Act of 1975/1976. It is suggested that deregulation would make airport financing more difficult since the stability of airline operations - that is, the maintenance of service by a given carrier - would no longer be assured. It is feared that airport facility planning would be complicated if the number of carriers, their type of equipment, and their support facilities fluctuated from year to year. Several air industry policies concerning maintenance of service and fares are recommended. M.L.

A79-14135 **Impact of regulatory measures - Safety, security, certification.** G. N. Kirk. In: International Air Transportation Conference, Washington, D.C., April 4-6, 1977, Proceedings. New York, American Society of Civil Engineers, 1977, p. 119-125.

Expenses caused airports by federal regulations requiring fire-fighting capability and antihijacking procedures are examined, and the possibility that such expenses could increase the cost of air fare and lead to a significant decrease in consumer use is considered. Although the number of hijackings have decreased since the application of antihijacking procedures, it is suggested that the data do not conclusively support the cost/benefit value of the fire-fighting capability. M.L.

A79-14141 **FAA's research and development priorities.** S. B. Poritzky (FAA, Office of Systems Engineering Management, Washington, D.C.). In: International Air Transportation Conference, Washington, D.C., April 4-6, 1977, Proceedings. New York, American Society of Civil Engineers, 1977, p. 326-344.

The FAA Engineering and Development program is discussed. Topics briefly examined include the growth of aviation, responsiveness to problems, safety, capacity/performance, staff/cost, typical demand/capacity/delay curves, forecast 1986-2000, ATC system 1990-2000, airports 1990-2000, and advanced systems development. Response to identified problems is the main priority of the program. M.L.

A79-14401 **SAFE Association, Annual Symposium, 15th, Las Vegas, Nev., December 5-8, 1977, Proceedings.** Canoga Park, Calif., SAFE Association, 1977. 308 p. $15.

The human factor in safety is considered along with USAF life support equipment costs, problems in contracting for system safety, the development of an automatic nerve agent alarm for chemical defense, regenerative life support systems for nuclear shelters, a pyrotechnic air generator, heat transfer principles in personal protection applications, and design considerations for inflatable head/neck restraint systems. Attention is given to the design of aircraft emergency devices for emergency use, an objective look at disaster exercises, an inflatable restraint system, a microwave radiometric attitude reference system for a rocket-powered pilot escape seat, a relative motion analysis of horizontal collision avoidance, the effectiveness of pilot warning instruments, a performance evaluation of the experimental beacon collision avoidance system, the prevention of helicopter mid-air collisions with the proximity warning device, the development of anti-G valves for high performance aircraft, and an economical approach to an accident information retrieval system. G.R.

A79-14404 **Problems in contracting for system safety.** L. E. Rackley and G. H. Lemon (General Dynamics Corp., Fort Worth, Tex.). In: SAFE Association, Annual Symposium, 15th, Las Vegas, Nev., December 5-8, 1977, Proceedings. Canoga Park, Calif., SAFE Association, 1977, p. 13-16.

Fault tree analysis is the method used for system hazard analysis, for assessing the safety level of the development aircraft and for predicting the safety level of the production aircraft at maturity. Source data for the fault tree logic diagrams are accumulated with the Subsystem Hazard Analysis (SSHA) program. Hazard analysis data are purchased from subcontractors. The Preliminary Hazard Analysis (PHA) identifies hazards in equipment and the Operating Hazard Analysis (OHA) identifies hazards in software and written instructions. One of the problems encountered in contracting for system safety is related to the failure of some subcontractors to properly identify 'command' failures. Another problem is connected with the failure to identify all part failure modes. G.R.

A79-15351 **Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings.** Symposium sponsored by IEEE, IES, ASME, ASQC, System Safety Society, AIAA, AIIE, and S.O.L.E. New York, Institute of Electrical and Electronics Engineers, Inc., 1978. 557 p. Members, $16.; nonmembers, $24.

Models of reliability and maintainability of systems are studied, and reliability concepts, attitudes, and policies are described. Topics discussed include logistics supportability testing, Air Force experience with reliability improvement warranties (RIW), time series analysis of failure data, contractor risk associated with RIWs, mechanical reliability for low cycle fatigue, effects of on-off cycling on equipment reliability, a life-cycle management cost model, fault-tree analysis with probability evaluation, computer-graphic design for human performance, and early identification of high-maintenance helicopters. P.T.H.

A79-15352 **Planning for complete supportability.** C. J. Morgan (Litton Systems, Inc., Woodland Hills, Calif.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 1-6.

It is proposed that military prime hardware and its support systems be first designed for simplified support in an austere wartime environment and then adapted, if necessary, to permit economical peacetime support. It is shown that present policy of designing equipment supportable by sophisticated test equipment to minimize peacetime support cost would lead to inefficient maintenance in a war environment. Instead, the contractor should define the hostile environment in which the equipment is to be supported. The BITE/BIT requirement might read as follows: 'BIT shall detect at least 95% of all equipment failures. At least 99% of detected failures shall be isolated to the faulty LRU by latching the LRU failure indicator and by providing a system malfunction output signal'. Design criteria for the BITE/BIT are formulated along with packaging guidelines that conform to this new policy. P.T.H.

A79-15353 **Revaluation of the Air Force actuarial system.** L. L. George (Texas A&M University, College Station, Tex.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 7-10. 8 refs. Contract No. F33600-77-C-0416.

The paper examines the Air Force actuarial system, a collection of methods for preparing engine management forecasts and reports. The method of obtaining estimates of interval failure rates, expected ages at engine removal, and other engine life information from past data is described, and the way these estimates are used to forecast replacement requirements and compute spare engine requirements is illustrated. The critical assumptions underlying the actuarial system are examined. Two major changes in Air Force engine management will necessitate changes in the actuarial system: (1) engines are now

designed with a modular structure, and (2) maintenance is now performed on a conditional basis. Consequences of these changes are discussed. P.T.H.

A79-15354 Computer support in Air Force Maintenance. J. D. Duckworth and R. P. Quintana (USAF, Logistics Management Center, Gunter Air Force Station, Ala.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 11-16. 13 refs.

This paper describes the personal views of the authors concerning plans to modernize the Air Force Maintenance Management Information and Control System (MMICS). It describes MMICS in a historical perspective; it identifies problems which must be addressed in the modernization process; and, it presents a maintenance management modernization concept that has been proposed by the authors. The views and opinions expressed in this paper should not in any way be construed to reflect any endorsement or confirmation by the Department of Defense or any other agency of the U.S. Government. (Author)

A79-15355 Logistics supportability testing. M. D. Jones and R. Mielec (U.S. Army, Logistics Center, Fort Lee, Va.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 17-21.

Logistics supportability is defined as the characteristics of a system and related support elements as they contribute to the retention and restoration of the materiel in an operationally effective status. The paper discusses general logistics issues and a general approach to logistics test design and data collection, and suggests methods for quantifying certain subelements of logistics. P.T.H.

A79-15356 Reliability-centered maintenance. F. S. Nowlan and H. F. Heap (United Airlines, Inc., San Francisco, Calif.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 38-44. 9 refs. Contract No. MDA-903-75-C-0349.

According to the principles of reliability-centered maintenance, each scheduled task in a maintenance program is generated by an evaluation of failure consequences followed by an examination of the explicit relationship between that task and the reliability characteristics of the equipment to determine whether the task is either essential from a safety viewpoint or desirable from a cost benefit viewpoint. The resultant scheduled maintenance program is the lowest-cost program with available information that ensures realization of inherent safety and reliability. There are four basic types of tasks to which these principles are applied: (1) on-condition inspection, (2) scheduled-rework, (3) scheduled-discard, and (4) failure-finding inspection. A decision diagram for reliability centered maintenance is presented. P.T.H.

A79-15357 Long term commercial warranty. H. Bayer and R. N. Speir (Douglas Aircraft Co., Long Beach, Calif.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 50-54.

The paper reviews the evolution of the warranty coverages offered by Douglas from the DC-8 through the DC-10. The coverage items discussed include defects in material and workmanship, defects in design and materials, failure to conform to detail specification, performance, warranty labor reimbursement, and transportation costs. The expanded coverage for the wide-bodies has provided six times the financial benefit to the operators over the initial DC-8 program coverage. P.T.H.

A79-15358 USAF experience with RIW. D. G. Newman (USAF, Systems Procurement Div., Washington, D.C.) and L. D. Nesbitt (USAF, Advanced Concepts Div., Wright-Patterson AFB, Ohio). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings.

New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 55-61. 7 refs.

The paper reports on current Air Force policy regarding Reliability Improvement Warranty (RIW). The mandatory analyses for RIW application include screening of equipment, assessment of RIW requirements in requests for proposal, evaluation of RIW proposals, and RIW/non-RIW cost analysis. Major Air Force applications of RIW include the ARN-118 Tacan, C-130 Omega Nav, various F-16 components, and the F-111 displacement gyro. Experience with these applications is summarized. P.T.H.

A79-15359 Tacan RIW program. A. J. Hauter and C. W. Strempke (Rockwell International Corp., Collins Avionics Group, Cedar Rapids, Iowa). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 62-65.

For Tacan, the reliability improvement warranty (RIW) program means a fixed price per unit delivered, a field MTBF requirement, and a fixed price to repair all returned equipment for a period of five years from date of first equipment delivery for two years from date of last delivery. In addition to the penalty of additional repair cost to the contractor if the MTBF was not achieved, there are also the additional penalties of (1) consignment of spares if the guaranteed MTBF is not met and (2) price adjustments for repair turnaround time greater than specified. The paper summarizes the reliability demonstration tests and field MTBF results for the Tacan program. P.T.H.

A79-15360 RIW data collection and reporting method. R. C. Day and L. E. McIntyre (Lear Siegler, Inc., Instrument Div., Grand Rapids, Mich.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 66-72.

RIW Programs with or without an MTBF guarantee usually contain a requirement for RIW data. This paper explains the different types of reports that can be beneficial to both the contractor and the military. A description of raw data requirements, their sources, and the formulas used to produce the summary reports will be given. Operation of the USAF's Autodin System will be explained. (Author)

A79-15361 Software quality assurance for reliable software. P. P. Howley, Jr. (Boeing Aerospace Co., Seattle, Wash.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 73-78. 29 refs.

Quality software must not only be error-free, but must also have good characteristics such as efficiency, portability, maintainability, and documentation. A software quality assurance methodology, termed SWQA, is proposed. The milestones for goal implementation through SWQA are system definition, software allocation, specification, design, code, verification, integration, and operation. SWQA consists of the application of disciplines for software planning, measurement and observation, and the application of tools and techniques. P.T.H.

A79-15362 The development of metrics for software R&M. G. F. Walters and J. A. McCall (General Electric Co., Sunnyvale, Calif.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 79-85. 11 refs. Contract No. F030602-76-C-0417.

This paper describes the derivation and validation of software metrics which provide a means for quantitatively specifying and measuring software quality. This work was part of a study of the factors in software quality conducted in support of the Air Force Systems Command Electronic Systems Division and Rome Air Development Center. The software metrics discussed are those which relate specifically to the quality factors of reliability and maintainability. (Author)

A79-15364 Program standards help software maintainability. B. B. White (TRW Defense and Space Systems Group, Redondo Beach, Calif.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 94-98. 6 refs.

The paper reports on the results of a research project that addressed the question: What relationship, if any, exists between the attitudes of software development managers toward programming standards and the effectiveness of the managers in enforcing the standards. Regression analysis on the responses of 108 managers to carefully formulated questionnaires indicate that a linear relationship exists between the variables 'attitude' and 'enforcement' for the following programming standards: modularity, structure coding, and in-code commentary standards. P.T.H.

A79-15366 Testing whether more failures occur later. M. Hollander (Florida State University, Tallahassee, Fla.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 103-106. 9 refs. Grant No. AF-AFOSR-76-3109.

This is an expository paper which illustrates the role of superadditivity, in reliability theory, as a means of describing wearout. Statistical inference procedures are described for testing that minus the logarithm of a life distribution is superadditive, and for testing that the mean value function of a nonhomogeneous Poisson process is superadditive. These tests are appropriate when the underlying processes suggest that new items are better than used ones but where one does not insist that the failure rate is increasing. (Author)

A79-15367 Profit or liability - Contract intent vs. content. R. M. Jacobs and A. B. Mundel (Consultant Services Institute, Inc., Livingston, N.J.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 117-122.

A relatively complex legal-reliability-liability case history is presented in an effort to establish an awareness of the pitfalls that can be encountered during all phases of the contract/product cycle. Two approximately equal parties signed a contract for the delivery of merchandise. Instead of continuing the relationship of a satisfied customer and a profitable manufacturer, they became adversaries in a protracted legal proceeding which culminated in an out-of-court settlement reached just prior to trial. The misconceptions and misinterpretations of both parties to the litigation are explored. B.J.

A79-15368 Contractor risk associated with reliability improvement warranty. H. S. Balaban (ARINC Research Corp., Annapolis, Md.) and M. A. Meth (U.S. Department of Defense, Washington, D.C.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 123-129. 12 refs.

The results of a DoD tri-service-sponsored study to investigate contractor risks associated with reliability improvement warranties (RIW) are summarized in this paper. To provide appropriate background, the RIW and RIW/MTBF guarantee concepts are first reviewed. Key contractor-risk issues are then identified and approaches for reducing risk suggested. Quantitative contractor-risk assessment models are developed and related to the issues of MTBF predictability and contractor warranty pricing. (Author)

A79-15374 Economics of commercial aviation safety. H. W. Wynholds (ECON, Inc., San Jose, Calif.) and L. Bass (Caputo, Liccardo, Rossi and Sturges, San Jose, Calif.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 162-166. 29 refs.

This paper addresses the fundamental issues of commercial aviation safety and economics for an industry that provides a service (transportation) for which there is a cost of production and a value of that service. The issue of just which level of safety best promotes the public interest can then be argued. It is shown that fundamental societal value judgements must be solved in order to determine the degree of commercial aviation safety that is socially optimal. It is also suggested that considerable care is required to arrive at an optimal social policy due to the complexity presented by the interaction of the regulated airlines and the relatively unregulated aircraft manufacturers. Highly simplified models may be useful in delineating some of the issues in these more complex and realistic problems of safety, economics and regulation. (Author)

A79-15380 Can we expect ECPs under RIW. P. O. Chelson (ARINC Research Corp., Annapolis, Md.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 204-209. 9 refs. Contract No. F09603-76-A-3231.

The paper presents a model for analyzing the potential profit or loss connected with the implementation of an engineering change proposal (ECP) under a reliability improvement warranty (RIW). Several examples are presented illustrating the fact that economic incentives often exist for a contractor to implement an identified ECP. ECPs addressing both reliability and maintainability improvements are considered. B.J.

A79-15386 Contractor initiatives for R&M/cost improvement. C. D. Weimer. In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 243-250. 6 refs.

This paper presents a synthesis of major findings and conclusions derived from four years research in electronics subsystems acquisition. Department of Defense policy statements for achieving improved reliability, maintainability, and cost are reviewed. The application and implementation of these policies are examined and the management response of system and subsystem contractors is described in areas of operating policies and procedures, project organization, cost management and control, and development program planning. The contractor experiences during their engineering development programs are subsequently evaluated in terms of operating problems or policy barriers. In total, the experiences of 43 contractors responding in 25 separate programs are examined and analyzed. Based upon their past experiences and management behavior, the appropriate response to successfully embrace future policy initiatives is postulated. (Author)

A79-15387 Maintainability and life-cycle costing. M. O. Locks (Oklahoma State University, Stillwater, Okla.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 251-253.

Administrative aspects and interfaces involving maintainability and life-cycle costing (LCC) are discussed, and maintainability and LCC concepts presented in military publications are summarized. Applications of quantifiable maintenance models are considered. Categories and elemental activities of active repair time are surveyed. M.L.

A79-15388 Development of a life cycle management cost model. R. K. Barasia and T. D. Kiang (Bell Northern Research, Ottawa, Canada.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 254-259. 6 refs.

The paper describes a life-cycle cost methodology use to carry out comparative engineering evaluations as an aid to management decision-making. The model can analyze a system that consists of one or more prime equipments situated at one or more locations. Maintenance and logistics support are taken into account. The methodology development program is examined, and case studies of model application are presented. M.L.

A79-15389 Logistics effect model /LEM/ applications. L. F. Eliel (Douglas Aircraft Co., Long Beach, Calif.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 260-266. USAF-supported research.

The described logistics effect model (LEM) is a component of an integrated system design/analysis approach to reducing the logistic support cost component of life cycle cost. The purpose of LEM is to direct attention to characteristics of particular line units, removable line-replaceable units (LRU), and non-LRU maintenance actions which contribute the most to logistic support cost. To a large extent, LEM uses definitions and symbols common to other models. LEM is used to minimize the amount of data required for analyzing potential tradeoffs early in the design cycle. M.L.

A79-15397 Products liability - Legal issues and technical answers. C. Dean and C. O. Smith. In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978; Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 355-359. 17 refs.

This paper reviews the current state of products liability. It indicates possible legal issues which may be raised in the form of allegations by the plaintiff's attorney. General technical response and actions which can be taken to counter the allegations are discussed. Proper action can minimize or eliminate a judgment as the safe product can be successfully defended. (Author)

A79-15412 Maintainability parameters using the consensus method. L. T. Jones (Ford Aerospace and Communications Corp., Houston, Tex.). In: Annual Reliability and Maintainability Symposium, Los Angeles, Calif., January 17-19, 1978, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 492-497. 6 refs.

This paper describes the reasons repair times were needed, why the consensus method was used, how the data was obtained, and the results. The 'consensus' method is a technique for finding, extracting, and organizing data which has not been documented, is unorganized, poorly developed, and is widely scattered among individuals. Its use is helpful when a decision or prediction is required and a more rigorous development is either too time consuming, too costly, or both. It can also be used for a quick check on other methods of data collection, especially when some unknown factor is suspected to have biased the data collection. The mathematical characteristics of two classical distribution functions often assumed for maintenance times, the exponential and the lognormal, are briefly discussed. The data are plotted and the curves are compared subjectively with the classical distributions. A method for extracting numerical parameters from the data is illustrated. (Author)

A79-16071 # Problems of inflation and exchange-rate fluctuations in an international organisation. H. Frank, J. Vuagnat, and H. Schullze (ESA, Directorate of Administration, Paris, France). *ESA Bulletin,* no. 16, Nov. 1978, p. 61-64.

ESA's financial situation is reviewed. Two possible approaches to solving ESA's financial problems suggested by the International Monetary Fund - an 'integrated' approach and a 'national' approach - are discussed. Implications for other international organizations are considered. B.J.

A79-16126 Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings. Congress sponsored by the Canaveral Council of Technical Societies. Cape Canaveral, Fla., Canaveral Council of Technical Societies, 1978. 216 p. $25.

Papers are presented on the current status of space transportation, technology transfer from Federal laboratories to the public and private sectors, solar energy utilization, and energy management and conservation. Consideration is also given to future space programs (e.g., space industrialization and advanced space transportation systems), NASA technology utilization programs, and advanced space technology (e.g., space power systems and large-area space systems). B.J.

A79-16129 Federal Laboratory Consortium for Technology Transfer - A national resource. G. F. Linsteadt (U.S. Naval Weapons Center, China Lake, Calif.). In: Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings. Cape Canaveral, Fla., Canaveral Council of Technical Societies, 1978, p. 2-1 to 2-6. 5 refs.

It is noted that Federal laboratories contain technology which can be adapted to address specific areas of concern faced by state and local governments. This paper describes the Federal Laboratory Consortium for Technology Transfer, which has as its major objective the transfer of existing expertise and capability within these Federal laboratories to help solve problems in the public and private sectors. B.J.

A79-16139 The NASA-Florida State Technology Application Center. R. A. Ramey and J. W. Hoover (State Technology Applications Center, Fla.). In: Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings. Cape Canaveral, Fla., Canaveral Council of Technical Societies, 1978, p. 5-9, 5-10.

The State Technology Applications Center (STAC) program - jointly sponsored by NASA, the State University System of Florida, and the Florida Department of Commerce - is intended to assist in the application of already developed technology to the problems of Florida's business and industrial community. This service is one of information retrieval which works in the following way: The user presents a question on which he wants documented information that may have been published and placed in a library somewhere. The STAC representative transmits the question to the STAC Library Center (LC). Then LC personnel, by remote computer terminal, search NASA RECON and other literature data bases for citations relevant to the specific question. B.J.

A79-16141 The NASA/IITRI Manufacturing Applications Team - Solving manufacturing problems through aerospace technology. E. R. Bangs (IIT Research Institute, Chicago, Ill.). In: Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings. Cape Canaveral, Fla., Canaveral Council of Technical Societies, 1978, p. 5-15 to 5-17.

The objective of the MATeam is to successfully transfer aerospace technology to solve key problems in the manufacturing sector of the economy. The underlying purpose of the effort is to increase the return on the nation's investment in aerospace research by fostering wide implementation and use of NASA technology and expertise. In accomplishing this objective, the team will provide an important intermediary link between technology sources and technology users in order to: (1) improve the communication process, (2) assist in the movement of new technology across organizational and disciplinary boundaries, and (3) shorten the time between technological development and its broad and effective implementation. The four target industries are: machine tool builders, light fabrication and assembly, heavy equipment manufacturers, and electronics assembly. B.J.

A79-16426 Industry/Joint Services Automatic Test Conference and Workshop on Advanced Test Technology, Management, Acquisition Support, San Diego, Calif., April 3-7, 1978, Proceedings. Conference and Workshop sponsored by the Aerospace Industries Association of America, Electronic Industries Association, National Security Industrial Association, et al. Washington, D.C., National Security Industrial Association, 1978. 677 p. $50.

ATE testing is discussed with reference to software configurations, automatic test generation, design for testability, nonelectronic tests, new technology, microprocessors, advanced ATE concepts, calibration, and interfaces. Systems engineering aspects of ATE are then considered along with ATE language standardization, test program sets, acquisition, and resource management. B.J.

A79-16445 # Risk analysis in the systems engineering process. E. E. Feltus (Westinghouse Electric Corp., Hunt Valley, Md.). In: Industry/Joint Services Automatic Test Conference and Workshop on Advanced Test Technology, Management, Acquisition Support, San Diego, Calif., April 3-7, 1978, Proceedings. Washington, D.C., National Security Industrial Association, 1978, p. 346-350. 6 refs.

Risk analysis is discussed in terms of identification of variables or areas of interest, formulation of design equations, identification of major drivers, formulation of probability distribution functions, and evaluation of risks. Examples of applying risk analysis and decision risk analysis are considered, with special emphasis on ways of applying risk analysis techniques. Injecting these techniques into models for computing single point estimates of resource and/or cost requirements of a system will reduce the chances of making unfavorable decisions in the systems engineering process. S.D.

A79-16448 # NAEC lessons learned. R. Brocchi (U.S. Navy, Naval Air Engineering Center, Lakehurst, N.J.). In: Industry/Joint Services Automatic Test Conference and Workshop on Advanced Test Technology, Management, Acquisition Support, San Diego, Calif., April 3-7, 1978, Proceedings. Washington, D.C., National Security Industrial Association, 1978, p. 452-455.

Procedures for organizing the work performed by the Automatic Test Equipment branch of the Naval Air Engineering Center are discussed. The branch is responsible for overseeing test program set (TPS) development at weapons systems contractor sites. Topics considered include key elements in TPS development, the writing of test requirements documents, and harmonization of Navy and contractor objectives. M.L.

A79-16577 Reliability as management problem (Zuverlässigkeit als Führungsaufgabe). W. Winkler. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 1-7. 8 refs. In German.

The paper discusses how in certain areas of research and industry the high reliability requirements have led to more complicated management problems. It is shown that the manager who has insight into the possibilities of reliability technology will be able to make better and more goal-specific decisions than if he used conventional means involving higher risk. Effects of reliability-management in medical technology and in chemical industry are studied. P.T.H.

A79-16578 The significance of reliability requirements in large-scale projects (Die Bedeutung von Zuverlässigkeitsforderungen bei Grossprojekten). K.-H. Giovanelli. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 9-11. 8 refs. In German.

The general problem of reliability of products is formulated, and the special problem associated with a large-scale project is discussed. The problem lies not so much in the solution of a new technological problem, but rather in simultaneous solution of a large number of interacting problems. P.T.H.

A79-16579 Integrated reliability education in quality assurance - A model experiment (In die Qualitätssicherung integrierte Zuverlässigkeitsausbildung - Ein Modellversuch). W. Eberle. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 13-15. In German.

The paper outlines a program of integrated reliability education tailored for the aerospace industry. The phases of quality assurance in design and development and quality assurance in production and maintenance are distinguished. A seminar on quality assurance management was instituted, and special courses on statistics, statistical planning of experiments, nondestructive testing, measurement with three-coordinate instruments, etc., were offered. A unified quality assurance methodology was the goal. P.T.H.

A79-16581 Reliability - Test philosophy (Zuverlässigkeit - Prüf-Philosophie). H. Gross and A. Weihe. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 23-28. In German.

Reliability test principles are developed that are based on the following three assumptions: (1) the reliability and failure behavior of a technical system is reproducible; (2) the reliability and failure behavior of technical systems is independent of prior history; and (3) the reliability and failure behavior of technical systems is statistically measurable. Examples of statistical test plans are discussed. P.T.H.

A79-16583 Reliability of aircraft structures (Die Zuverlässigkeit von Flugzeugstrukturen). H.-J. Zocher. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 33-42. 24 refs. In German.

The paper sets forth constructive, computational, and experimental methods which, in conjunction with goal-specific maintenance and inspection measures, ensure operational safety and reliability of modern aircraft. The discussion covers the damage tolerant structure concept, computational methods of establishing the life of a structure, determination of residual life after crack phase sets in, and a methodology for laying out total-structure fatigue tests. P.T.H.

A79-16587 Control of EDP software reliability during software design (Beeinflussung von EDV-Software-Zuverlässigkeit beim Software-Entwurf). A. Ehrismann. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 61-66. In German.

The concept of reliability of EDP software is discussed, and a means of ensuring software reliability through a carefully chosen design procedure is described. The stages of software design are characterized as functional design, software planning, and test planning. The effects of software deficiencies on operation reliability are examined. P.T.H.

A79-16590 Relationship between quality and reliability (Qualität und Zuverlässigkeit, ihre Beziehung zueinander). H. Wagner. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 79-82. In German.

Quality is here defined as the agreement between performance specifications and actual performance, while reliability is understood to mean the probability that the product functions correctly under prescribed conditions for its rated service life. The relationship between quality and reliability so defined is illustrated on four examples: (1) education of personnel, (2) quality level of electronic components, (3) control of receipt and production of goods, and (4) storm warning procedures. P.T.H.

A79-16591 Reliability improvement program (Zuverlässigkeitsverbesserungsprogramm). C.-P. Klauser. *(Verein Deutscher Ingenieure, Tagung über Zuverlässigkeit und Qualität in der Luft- und Raumfahrt, Hanover, West Germany, Apr. 27, 28, 1978.) VDI-Berichte,* no. 307, 1978, p. 83-86. In German.

A program for improving the reliability of products is proposed which is aimed at equipment in the late development and testing stage or even during service. The program is oriented along the current knowledge of the failure behavior of electronic components and their possibilities for modification by changing their operating and environmental loads. Weak spots in a device are detected and located experimentally. P.T.H.

A79-17226 International Clean Air Conference, Brisbane, Australia, May 15-19, 1978, Proceedings. Conference sponsored by the Clean Air Society of Australia and New Zealand. Edited by E. T. White (Queensland, University, Brisbane, Australia), P. Hetherington, and B. R. Thiele (Air Pollution Control, Brisbane, Australia). Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1978. 791 p. $36.

Various aspects of air pollution control and monitoring are reviewed primarily with reference to the Australian situation. Particular consideration is given to the Sydney Oxidant Study, electrostatic precipitation, industrial collectors, health effects of air pollution, pollution control equipment technology, atmospheric surveys, motor vehicle emissions, photochemistry, and impact studies. B.J.

A79-17227 Governmental efforts to develop and diffuse innovative pollution control equipment. R. J. Tobin (New York, State University, Buffalo, N.Y.). In: International Clean Air Conference, Brisbane, Australia, May 15-19, 1978, Proceedings. Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1978, p. 3-17. 17 refs.

The efforts of the U.S. Government to develop flue gas desulfurization technology and to diffuse it have provoked acrimonious debate and long-standing controversy between the government and many electric utilities. This paper attempts to show that electric utilities tend to install pollution-control equipment when they want to and not when the government believes it to be environmentally desirable. It is shown that the EPA's problems with flue gas desulfurization are also typical of many other government efforts to diffuse innovations. B.J.

A79-18126 American Helicopter Society, Annual National Forum, 34th, Washington, D.C., May 15-17, 1978, Proceedings. Washington, D.C., American Helicopter Society, 1978. 719 p.

The papers report on new developments in helicopter design, testing, analysis, structures and materials, and navigation equipment. Topics studied include correlation of full scale test results of a main rotor with model test results, rotor airfoil optimization, helicopter combat mission simulator, application of composites to secondary structures, the aeroelastically conformable rotor concept, handling qualities of the YAH-64 advanced attack helicopter, filament wound rotor blade, and an innovative technique for dynamic testing of V/STOL aircraft. P.T.H.

A79-18159 Service quality optimization - Engineering production and quality control converging actions. A. Sappa (Aerospatiale Helicopter Corp., Grand Prairie, Tex.). In: American Helicopter Society, Annual National Forum, 34th, Washington, D.C., May 15-17, 1978, Proceedings. Washington, D.C., American Helicopter Society, 1978. 9 p. (AHS 78-33)

The convergence of production and quality control is illustrated on the example of the AS 350 Astar. A central element in the discussion is the Autonomous Development Unit (ADU), a group of less than 100 persons covering design development, prototype production, and testing and industrialization tasks. The role of the ADU in a large concern is outlined. Interactions at the technological choice level are discussed. P.T.H.

A79-19731 # Effective reliability testing and growth measurement. A. S. Golant. *American Society of Mechanical Engineers, Winter Annual Meeting, San Francisco, Calif., Dec. 10-15, 1978, Paper 78-WA/Aero-21.* 7 p. 11 refs. Members, $1.50; nonmembers, $3.00.

The reliability/test problem as reported by Swett (1976) is considered. It is pointed out that Swett has fairly clearly stated the reliability/test problem as it existed prior to the issuance of the recent MIL-STD-2068 and MIL-STD-781C. Reliability achievement involves the performance of realistic development tests, analysis, and correction of failure modes found during those tests, and the effective feedback of information gained in order to maximize growth during this development phase. Reliability tests can generally be summarized by three categories, related to development, demonstration, and life. Attention is given to a brief review of MIL-STD-781B, the development of realistic testing, a brief review of the new MIL-STD's, the K-factors in reliability testing, a development testing overview, the conduction of demonstration tests, and reliability growth monitoring during testing. G.R.

A79-20775 * Inspection error and its adverse effects - A model with implications for practitioners. R. D. Collins, Jr. (NASA, Marshall Space Flight Center, Huntsville, Ala.), K. E. Case (Oklahoma State University, Stillwater, Okla.), and G. K. Bennett (South Florida, University, Tampa, Fla.). *AIIE Transactions,* vol. 10, Mar. 1978, p. 2-9. 20 refs.

Inspection error has clearly been shown to have adverse effects upon the results desired from a quality assurance sampling plan. These effects upon performance measures have been well documented from a statistical point of view. However, little work has been presented to convince the QC manager of the unfavorable cost consequences resulting from inspection error. This paper develops a very general, yet easily used, mathematical cost model. The basic format of the well-known Guthrie-Johns model is used. However, it

is modified as required to assess the effects of attributes sampling errors of the first and second kind. The economic results, under different yet realistic conditions, will no doubt be of interest to QC practitioners who face similar problems daily. Sampling inspection plans are optimized to minimize economic losses due to inspection error. Unfortunately, any error at all results in some economic loss which cannot be compensated for by sampling plan design; however, improvements over plans which neglect the presence of inspection error are possible. Implications for human performance betterment programs are apparent, as are trade-offs between sampling plan modification and inspection and training improvements economics. (Author)

A79-22162 Quantification of the storage logistics thermal environment. H. C. Schafer (U.S. Naval Weapons Center, China Lake, Calif.). *Journal of Environmental Sciences,* vol. 22, Jan.-Feb. 1979, p. 28-32. 26 refs.

Environmental criteria determination is discussed with reference to the 'real life' of military materiel exposed to thermal conditions typical of any given part of the world. While data for extreme exposure locations have been obtained, fewer data are available for temperate zones; the lack of these data biases 'worldwide probable chance of occurrence' displays toward the extreme. Processing the vast quantity of field-measured thermal data is simplified by noting that nature tends toward moderation even in the more extreme climatic zones of the earth. The necessity for being precise as to the specific environment encountered by a given kind of materiel is stressed, and skin temperature probability information for different forms of transport and storage is presented. Procedures for interpreting the information are considered. M.L.

A79-22720 An application and case history of a dynamic R & D portfolio selection model. L. Chiu and T. E. Gear (Auckland, University, Auckland, New Zealand). *IEEE Transactions on Engineering Management,* vol. EM-26, Feb. 1979, p. 2-7. 14 refs. Research supported by the University of Auckland and Wool Research Organization of New Zealand.

A variety of formal mathematical models have been proposed which are based on a portfolio approach to a total R&D program. However, there have been few descriptions of applications appearing in the subsequent literature. This paper presents an application of stochastic integer-programming formulation to a portfolio of projects (each of which were planned with the aid of a decision-tree structure). Follow-up studies undertaken one year later are described in an attempt to assess the accuracy of the data and adequacy of the model in practice. (Author)

A79-22721 The acquisition of technical information by R & D managers for problem solving in nonroutine contingency situations. W. A. Fischer (North Carolina, University, Chapel Hill, N.C.). *IEEE Transactions on Engineering Management,* vol. EM-26, Feb. 1979, p. 8-14. 32 refs.

This paper explores the effects of nonroutine requirements and a high-pressure situation on the process of technological information acquisition by R&D managers for problem solving in R&D groups. A survey of R&D managers in 116 firms in four industries reveals that nonroutine requirements in a contingency situation do affect their technical information acquisition behavior. Firm size and the direction of past involvement with the nonroutine requirements appear to be particularly important determinants of the degree of change experienced in technological information acquisition. Information sources that are informal and which provide access to a wide variety of experience appear to be the most valuable sources in such situations. (Author)

A79-22722 A model for studying some organizational effects of an increase in the size of R & D projects. A. W. Pearson (Manchester, Victoria University, Manchester, England), T. Green (British Leyland UK, Ltd., London, England), and D. F. Ball (Salford, University, Salford, Lancs., England). *IEEE Transactions on Engineering Management,* vol. EM-26, Feb. 1979, p. 14-21. 5 refs.

A model is developed to deal with the problem of possible mismatch that can arise when project size is increased while the size of the R&D department and the exploiting capacity remain constant. A base case is considered in which there are 32 single unit projects. Expected values of contribution to the profit are then computed for sets of projects of size 2, 4, 8, etc., and for situations in which numbers of single unit projects are substituted by sets of larger projects. This is done for different choices of the probabilities of success. As larger projects are included, the expected profit tends to drop. A means of reestablishing contribution is to increase the probability of success of individual projects by, for example, increasing the efficiency of the screening procedure for project selection. However, even when the success probability adjustment has been made large enough to restore expected contribution, the variance remains higher than in the base case. The proper strategy will depend on the average probability of success. P.T.H.

A79-23626 Canadian Reliability Symposium, 5th, Ottawa, Canada, October 19, 20, 1978, Proceedings. Symposium sponsored by the Society of Reliability Engineers. *Microelectronics and Reliability,* vol. 19, no. 1-2, 1979. 175 p.

Consideration is given to such areas as reliability and maintainability management, life-cycle costing, software reliability, reliability and maintainability analytical techniques, nuclear power reliability and maintainability, large-scale integration reliability, and system reliability and maintainability. Particular consideration is given to the management of satellite system reliability programs, a design review approach toward dynamic RAM reliability, and the CP-140 aircraft reliability program. B.J.

A79-23627 Management of satellite systems reliability program. F. Behmann (Telesat Canada, Ottawa, Canada). *(Society of Reliability Engineers, Canadian Reliability Symposium, 5th, Ottawa, Canada, Oct. 19, 20, 1978.) Microelectronics and Reliability,* vol. 19, no. 1-2, 1979, p. 15-21.

The management aspects of a reliability program are examined relating to objectives, organization, and program assurances. The management system must assure that all products and product characteristics needed for mission success are identified, required, and demonstrated. Basic activities of a satellite system reliability program are outlined including reliability considerations, requirements, and achievement. A cost-effective satellite system configuration is described. Effective assurances and decision making for the reliability program are discussed. B.J.

A79-23628 The logistics of life cycle cost. J. R. Peronnet (Grumman Aerospace Corp., Bethpage, N.Y.). *(Society of Reliability Engineers, Canadian Reliability Symposium, 5th, Ottawa, Canada, Oct. 19, 20, 1978.) Microelectronics and Reliability,* vol. 19, no. 1-2, 1979, p. 23-30.

Key aspects of life cycle cost (LCC) methodology synthesis are reviewed and the ease of program application and integration is illustrated on such programs as the Canadian New Fighter Aircraft concept. Consideration is also given to the interrelationship between hardware design, ILS resource requirements, and program cost impacts of prime support postures as well as alternate support plan concepts. It is concluded that by selectively blending and tailoring the available logistic analysis tools such as LSA and Pareto analysis within an interactive phased program analysis approach and applying the discipline inherent in the systems engineering process, an orderly consistent and expanding data base can be developed on a program upon which alternate support concepts can be realistically projected and tested. B.J.

A79-23629 **Reliability and maintainability growth of a modern, high performance aircraft, the F-14A.** G. Bigel and J. Winsten (Grumman Aerospace Corp., Bethpage, N.Y.). *(Society of Reliability Engineers, Canadian Reliability Symposium, 5th, Ottawa, Canada, Oct. 19, 20, 1978.) Microelectronics and Reliability*, vol. 19, no. 1-2, 1979, p. 31-38.

This paper presents an historical overview of the F-14A Reliability and Maintainability growth with the concurrent impact on the logistic support posture. The design is traced from the RDT&E phase, where for the first time, comprehensive R&M parameters were established as requirements rather than goals. During the initial aircraft design, careful attention was given to the Reliability, Maintainability, and Serviceability requirements resulting in the incorporation of new test, servicing, handling and interchangeability features. Through the incorporation of these features in the basic design, the Maintenance Manhours per Flight Hour, Mean Time to Repair, and Mission Success values were successfully achieved and demonstrated. Improvements in reliability and maintainability have resulted in significant improvements in Elapsed Maintenance Time per Maintenance Action, loading of shop test equipment (2nd line Maintenance) and aircraft component removals. (Author)

A79-23632 **CP-140 aircraft reliability program - A 'tailored' management approach.** R. F. Steiner. *(Society of Reliability Engineers, Canadian Reliability Symposium, 5th, Ottawa, Canada, Oct. 19, 20, 1978.) Microelectronics and Reliability*, vol. 19, no. 1-2, 1979, p. 133-139.

The reliability program conducted during the Canadian CP-140 aircraft development and production phases is described. Such program constraints as low cost, small production run, and large mix of off-the-shelf, modified and newly developed avionics equipment dictated the use of innovative and practical approaches in the reliability management aspect of the program. Particular consideration is given to tailoring the reliability program to meet the above constraints while improving the reliability effectiveness over prior aircraft development programs. B.J.

A79-24956 **Reliability growth management, testing, and modeling; Proceedings of the Seminar, Washington, D.C., February 27, 28, 1978.** Seminar sponsored by the Institute of Environmental Sciences. Mt. Prospect, Ill., Institute of Environmental Sciences, 1978. 90 p. $10.00.

A collection of papers is presented, which are essentially concerned with problems related to reliability growth management, design modifications, reliability improvement testing, and operational evaluation. Attention is given to the usefulness of a reliability improvement warranty, as well as to ways of identifying and correcting reliability problems as early as possible in the life cycle, including the engineering development phase. Reliability growth via design changes is shown to be of prime importance. Topics of interest include software reliability growth policy, comparisons of reliability growth experience, reliability growth on 8-52 FLIR system and related applications of reliability growth analysis. S.D.

A79-24962 **CORADCOM's reliability growth policy.** M. G. Zsak, Jr. (U.S. Army, Communications Research and Development Command, Fort Monmouth, N.J.). In: Reliability growth management, testing, and modeling; Proceedings of the Seminar, Washington, D.C., February 27, 28, 1978. Mt. Prospect, Ill., Institute of Environmental Sciences, 1978, p. 42-45; Discussion, p. 45. 6 refs.

The paper outlines reliability growth requirements and objectives, along with the Duane and AMSAA models for reliability growth assessment. The objective of reliability growth policy is to serve as a management tool. In particular, reliability growth techniques and/or models help managers to place the growth of reliability early in the development cycle and to control its progress as the design matures. The project manager is required to present a reliability growth chart which depicts the project manager's planned growth curve, the contractor's planned growth curve, and the actual growth obtained during testing. The purpose of this chart is to present the planned growth and show its relationship to reliability thresholds and to required operational capabilities requirements. Three examples are given to show how reliability growth methodology has been applied and has affected the development programs of project-managed items. S.D.

A79-24957 **RPM - A recent real life case history.** J. M. Clarke and W. P. Cougan (General Electric Co., Aircraft Equipment Div., Utica, N.Y.). In: Reliability growth management, testing, and modeling; Proceedings of the Seminar, Washington, D.C., February 27, 28, 1978. Mt. Prospect, Ill., Institute of Environmental Sciences, 1978, p. 10-16; Discussion, p. 17.

The paper presents a result-oriented case history of a reliability growth and demonstration test program conducted for a complex airborne surveillance radar processing system under Combined Environmental Reliability Test (CERT) conditions. The reliability growth or Test-Analyze-And-Fix (TAAF) test plan was dimensioned in accordance with the methodologies presented in 'Reliability Planning and Management' (Selby and Miller, 1970) and by Duane (1964). The paper describes in detail the significant elements of the test program including TAAF planning methods, the actual time-related pattern of growth test failure precipitation and the effects of changing CERT conditions, the method of implementing an effective closed-loop corrective action system, approaches taken to determine the achieved reliability growth level, and finally, the reliability demonstration test results. (Author)

A79-24963 **Reliability growth through the Air Force Reliability Improvement Warranty /RIW/ program.** D. G. Newman (USAF, Systems Procurement Div., Washington, D.C.). In: Reliability growth management, testing, and modeling; Proceedings of the Seminar, Washington, D.C., February 27, 28, 1978. Mt. Prospect, Ill., Institute of Environmental Sciences, 1978, p. 46-49; Discussion, p. 50, 51. 7 refs.

The objective of the Air Force Reliability Improvement Warranty (RIW) is to motivate and provide an incentive to contractors to design and produce equipment with low failure rate as well as low repair costs after failure due to field/operation use. RIW uses the inherent incentives of a fixed-price contract to harness the profit motive to bring about reliability growth and reduced repair costs during the long-term warranty period. Air Force applications of the RIW including an MTBF guanrantee are discussed. The MTBF guarantee is a powerful incentive which imposes additional risk on the contractor and complicates both the formulation of the contract and administration of the warranty. S.D.

A79-25887 **Cost analysis of pilot training systems.** H. F. Harris and H. E. Boren, Jr. (Northrop Corp., Los Angeles, Calif.). *Society of Automotive Engineers, Aerospace Meeting, San Diego, Calif., Nov. 27-30, 1978, Paper 781005.* 7 p.

This paper discusses the resources that must be considered when determining the costs of pilot training systems. Material presented here is based on the authors' experience in estimating the cost of current and advanced Pilot Training Systems. The paper examines how system requirements, such as number of students, attrition rates, course syllabi, and maintenance concepts impact training system personnel and equipment cost. The discussion also shows the sensitivity of pilot training cost to variations in training system requirements and hardware characteristics. (Author)

A79-25898 **Procuring equipment items that meet R, M and SS requirements.** R. K. Hood (Boeing Aerospace Co., Seattle, Wash.). *Society of Automotive Engineers, Aerospace Meeting, San Diego, Calif., Nov. 27-30, 1978, Paper 781025.* 15 p. 10 refs.

The paper presents several approaches for a major or system contractor to follow in order to ensure the successful procurement of products that meet reliability (R), maintainability (M) and system safety (SS) requirements. R, M and SS requirements can be included in the Applicable Documents, Requirements, Quality Assurance and Notes sections of the product specifications, in the Statement of Work (SOW) and in the data item list, or Contract Data Requirements List (CDRL). The statement of means of verifying compliance with R and M requirements is also important. Certain aspects of R, M and SS and program requirements specific to each discipline are reviewed, stressing the roles of analysis, prediction and verification. A.L.W.

A79-27325 # **Urban passenger transport planning (Planirovanie gorodskogo passazhirskogo transporta).** D. M. Livshits. Moscow, Izdatel'stvo Transport, 1978. 207 p. 12 refs. In Russian.

The planning of the various enterprises involved in passenger transport in Moscow is the subject of the book. The method of determining the vehicle needs is discussed, and attention is given to various ways of fare collection, methods of developing the labor plan for the operating concerns, and methods of determining norms for the operating expenses. Regulations on the new planning and economic stimulus system are explained, and problems in the planning of the most important characteristics of the repair facilities are discussed. P.T.H.

A79-28899 **Economics, politics and law - Recent developments in the world of international air charters.** A. F. Lowenfeld (New York University, New York, N.Y.) and A. I. Mendelsohn (Glassie, Pewett, Beebe and Shanks, Washington, D.C.). *Journal of Air Law and Commerce,* vol. 44, no. 3, 1979, p. 479-508. 72 refs.

It is pointed out that since the close of World War II there has been no period which has been so marked by institutional changes in international civil aviation as was the time span of 1977 to 1978. Some of the essential aspects of the changes in U.S. charter law and policy are examined. The development of the Civil Aeronautics Board's (CAB) charter rules from affinities to public charters is considered along with the first response to the proposal for public charters, the charter rules and bilateral accords, and the economics of supplemental carriers. Attention is also given to the changing philosophy of the CAB approach to charters, the new environment, and the supplementals in the new environment. G.R.

A79-29550 **An introduction to airline economics.** W. E. O'Connor (Embry-Riddle Aeronautical University, Daytona Beach, Fla.). New York, Praeger Publishers, 1978. 268 p. 110 refs. $17.34.

The work is an introductory textbook to the economics of the airline services of the United States, both domestic and international. An overall view of the airline industry is presented along with the many ways in which the airlines serve the public interest and assist in the achievement of various individual and governmental goals. Attention is given to the basic economics of the industry, with particular reference to entry of airlines into markets and exit from them. Also discussed are airline costs, demand of airline services, extensive treatment of airline rates, air cargo services, and analysis of certain current problem areas such as labor relations, airport relations, and the impact of regulatory reform (deregulation) on various aspects of airline service. S.D.

A79-29713 # **Procurement of the Orbital Test Satellite.** B. Stockwell (ESA, Communications Satellites Dept., Paris, France). *ESA Bulletin,* no. 17, Feb. 1979, p. 61-65.

The paper presents contract activities for the procurement of the Orbital Test Satellite (OTS) from its development contractor. The main development contract is outlined, noting that the incentive scheme is considered the major factor in assuring in-orbit performance and schedule compliance. Fixed-price payments were set for 80% of the contract and incentives for cost savings, in addition to normal cost control procedures, were employed for the remaining reimbursed costs. The contract is now close to completion with the results that the OTS-1 flight model review was completed eleven days ahead of target date and OTS-2 was delivered only one day late, due to launcher difficulties. It is expected that in the cost reimbursement area the contract price will be met almost exactly. A.L.W.

A79-30583 # **Design-to-cost and Aérospatiale's Aircraft Division.** A. Etesse (Société Nationale Industrielle Aérospatiale, Aircraft Div., Paris, France). *Aircraft Engineering,* vol. 51, Mar. 1979, p. 23-25.

The Aérospatiale design-for-optimum-cost method, derived from the design-to-cost control method and intended for new civil aircraft programs, is discussed. The method offers a new approach to the problem of cost and selling prices in that in addition to its analytical aspects and the systematic analysis of all costs, it allows efficient collaboration at each stage in the project between the different departments involved in the program. Studies for the new A200 aircraft were conducted by applying the method, and the results have shown to be favorable. A.A.

A79-30926 **Annals of air and space law. Volume 3.** Edited by N. M. Matte (McGill University, Montreal, Canada). Toronto, Carswell Co., Ltd.; Paris, Editions A. Pedone, 1978. 673 p. In English and French. $25.

A changed regulatory stance adopted by the CAB during the Carter Administration, the collision of two jumbo jets at Tenerife in 1977, and the crash of the Soviet space vehicle Cosmos 954 in Canadian territory are among recent developments which have affected the course of air and space law. Topics discussed in these annals include the public service function of airports, the air carrier's right to refuse carriage, provisions concerning the registration of aircraft accident deaths, current regulations governing charter flights, the local administration of Canadian airports, aircraft manufacturers' liability, wake turbulence and negligence claims, the United Nations draft treaty on the moon, and the protection of intellectual property transmitted by communications satellites. J.M.B.

A79-30936 # **Government control of the air transport system in India.** P. K. Menon (University of the West Indies, Bridgetown, Barbados). In: Annals of air and space law. Volume 3. Toronto, Carswell Co., Ltd.; Paris, Editions A. Pedone, 1978, p. 163-183. 55 refs.

The history of the international and domestic branches of Indian airlines is discussed. The international airline was inaugurated in 1948 with government assistance; in 1953 it was acquired by Air India, the nationalized corporation. The domestic airline came into being in 1953. Established by the absorption of eight competing airlines, it was faced with the necessity of rationalizing its route and organizational structures in order to survive financially. Economic, military and safety considerations determining Indian airlines policy are discussed, and the ministerial and parliamentary control of policy is considered. J.M.B.

A79-30938 # **Charter flights and the role of the tour operator.** G. Romanelli (Bologna, Università, Bologna, Italy) and M. A. Miszerak. In: Annals of air and space law. Volume 3. Toronto, Carswell Co., Ltd.; Paris, Editions A. Pedone, 1978, p. 207-217. 40 refs.

Unlike regular air carriage, charter flights involve a single contractual agreement between three parties: the carrier, the charterer, and the individual passenger. The liability of the carrier and the tour operator toward the passenger contracting for charter services is examined with special reference to the 1970 Convention on Travel Contracts. It is pointed out that the charterer assumes direct liability for violations on the part of passengers of the regulations established by the carrier. J.M.B.

A79-30946 # **The activities of the European Space Agency since its founding (Les activités de l'Agence Spatiale Européenne depuis sa création).** M. Bourély. In: Annals of air and space law. Volume 3. Toronto, Carswell Co., Ltd.; Paris, Editions A. Pedone, 1978, p. 373-382. 15 refs. In French.

The European Space Agency (ESA) was created in May, 1975 by a convention signed by members of two previous European space organizations (CRS/ESRO and CECLE/ELDO) to replace those organizations, and has been in operation for over three years, although the convention has not yet come into effect, since it has not been ratified by all the member states. The convention provides for voluntary and obligatory activities of the member states. The recent economic crisis has had consequences in ESA programs, reducing the emphasis on research and development and leading to concentration on programs with immediate and practical benefits. The agency has continued the programs of its predecessors, resulting in the launch of the COS-B, GEOS, ISEE 1, 2 and 3, IUE, Meteosat and OTS 1 satellites. Work underway includes the Exosat satellite, the Out of Ecliptic space probe, the Space Telescope, the Space Sled, ECS 1 and 2 communication satellites, Marots A and B maritime satellites, Spacelab and the Ariane launch vehicle. A.L.W.

A79-33601 Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings. Canoga Park, Calif., Survival and Flight Equipment Association, 1979. 368 p. $25.

Papers are presented on such topics as conflict alert for air traffic control systems, the feasibility demonstration of a vertical seeking seat steering system, development of parachutes with automatic inflation modulation, characterization of thunderstorms for safe aircraft operations, and Navy development of an onboard oxygen generation system. Attention is also given to aircrew protective breathing equipment, aircraft accident investigation, experimental stress analysis of parachute canopies, and evolution of aircrew restraint systems. B.J.

A79-33603 A method of schedule acceleration for system safety programs. G. H. Lemon (General Dynamics Corp., Fort Worth, Tex.). In: Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings. Canoga Park, Calif., Survival and Flight Equipment Association, 1979, p. 12-17.

The principal advantage of an accelerated program is that the cost of redesign and retrofit for safety improvement is minimized. Current fault tree analysis provides its greatest payoff after retrofit becomes expensive. This paper presents a method for solving this problem: It is suggested that subsystem hazard analysis data be purchased from equipment suppliers and fault tree logic allocation be developed concurrently with data preparation. B.J.

A79-33604 The impact of quality control on the logistics management of USAF life support equipment. S. Idrogo and G. O. Gutierrez (USAF, San Antonio Air Logistics Center, Kelly AFB, Tex.). In: Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings. Canoga Park, Calif., Survival and Flight Equipment Association, 1979, p. 21-24.

This paper focuses on the various levels of quality assurance that are employed in the procurement process and highlights some recent experiences where the quality of products delivered were below the specified requirements. The case histories are presented to portray how quality deficiencies impact the logistics management of Life Support equipment and the operation of the Aircraft using Commands in terms of costs, time, and aircraft groundings, Finally, it is recommended that manufacturers place more emphasis on their quality assurance programs to avoid added costs and constraints that would result if government controls were increased. (Author)

A79-34836 # **Financing alternatives for space industrialization.** J. P. Vajk (Science Applications, Inc., Pleasanton, Calif.), R. D. Stutzke (Science Applications, Inc., Colorado Springs, Colo.), M. S. Klan (Science Applications, Inc., Huntsville, Ala.), R. Salkeld, and G. H. Stine. *Princeton University and American Institute of Aeronautics and Astronautics, Conference on Space Manufacturing Facilities, 4th, Princeton University, Princeton, N.J., May 14-17, 1979, AIAA Paper 791389.* 15 p. 11 refs. Contract No. EG-77-C-01-4024.

Large scale space industrialization projects challenge conventional methods of financing commercial undertakings. As part of the Department of Energy's Satellite Power System Concept Evaluation Program, we examined the problems of financing both the lengthy and expensive R&D phase and the capital-intensive commercial implementation phase of an SPS program. Ten alternative schemes, ranging from purely public to purely private, were developed. One of these, a purely private enterprise approach, is already underway. Some of the alternatives presented here may be readily adapted to other space industrialization projects and to large-scale terrestrial projects as well. (Author)

A79-34884 Concepts of cost control (Concepts de maîtrise des coûts). Mr. Dozières, Mr. Dumas, Mr. Eslinger, Mr. Fougerat, Mr. Foure, Mr. Houdion, Mr. De Maistre, Mr. Tassinari, and Mr. Victor. *L'Aéronautique et l'Astronautique,* no. 75, 1979, p. 32-38. In French.

The cost effectiveness method of production cost reduction and the concepts of value analysis, design to cost and design to life cycle cost as they have been successively developed by the United States Department of Defense are examined. Production cost reduction consists of modifications to product plans and production methods without substantially altering the design of the product, in order to reduce production costs. Value analysis is a specific method for detecting and eliminating unnecessary costs while reducing necessary costs with the goal of achieving the best compromise between product quality and performance and production cost. Design to cost is a method of program management which guides product design to best satisfy production cost and performance objectives, while the design to life cycle cost method takes into account the costs incurred over the life of the product. Contractual implications of the methods are also discussed. A.L.W.

A79-35099 Capital grants and recurrent subsidies - A dilemma in American transportation policy. M. Wachs (California, University, Los Angeles, Calif.) and J. Ortner (California, University, Irvine, Calif.). *Transportation,* vol. 8, Mar. 1979, p. 3-19. 26 refs. Research supported by the John S. Guggenheim Foundation.

Transportation policy in America distinguishes between capital expenditures and recurrent operating and maintenance costs. Federal policy and resources encourage capital-intensive projects, but traditionally have left to state and local governments the responsibility for maintaining and operating the facilities built with federal support. This has led to consistent underestimation of operating costs in the decision process leading to capital expenditures, and to overcapitalization of transportation networks. Today, faced with recurrent costs which strain local resources, there is pressure to broaden federal participation in operations and maintenance, and legislation is beginning to weaken the traditional distinctions between capital and recurrent expenditures. (Author)

A79-36547 # **Planning for STS operations.** C. M. Lee. *American Astronautical Society, Annual Rocky Mountain Guidance and Control Conference, Keystone, Colo., Feb. 24-28, 1979, Paper 79-053.* 24 p.

The paper stresses the need for adequate long range planning to ensure successful operation of the Space Transportation System (STS). The STS, built around the Space Shuttle, represents a breakthrough to low cost, large capacity spacecraft from high cost, low capacity, expendable launch vehicles. Five major success factors are addressed in particular. These are: new management concepts,

new applications, STS enhancement, new space research tools, and new users. Under management concepts, the necessary planning and the automated management information systems to implement it are covered. Enhancement of the STS includes a thrust augmentation option to enable carrying of greater payloads. New tools such as the Long Duration Exposure Facility being developed by NASA, the Multi-Mission Satellite, and the 'Get-Away Special' (GAS) payload cannister are investigated. Also stressed is the need to reach new customers who have previously not participated in space projects due to the high cost and lack of know-how. M.E.P.

A79-36548 # **Commercial potential of the Space Shuttle.** G. W. Keyes (Boeing Aerospace Co., Seattle, Wash.). *American Astronautical Society, Goddard Memorial Symposium, Washington, D.C., Mar. 28-30, 1979, Paper 79-058.* 10 p.

Benefits of major investment by private industry in government space programs are presented. The U.S. space program is approaching a transition to the Space Shuttle which will create new opportunities in telecommunications, earth observation, energy, and materials processing. Expanded space telecommunications will create a large market in transmission of subsidiary communications such as electronic mail; the remote sensing Landsat system data could be used for weather and crop forecasting; and solar power satellite technology could be commercialized. Private industry can offer large capital investment and marketing capability exemplified by worldwide preeminence of the U.S. aerospace industry. Increased innovative development of space applications caused by participation of large numbers of individuals, reduced federal funding, and revenue returned to government are some of the possible benefits of private industry participation. Investigations showed that private industry shuttle operation can be profitable but significant questions regarding technical and financial details still exist. A.T.

A79-36550 # **The European approach to the financing of space ventures.** H. Dummler (Bankhaus Reuschel und Co., Munich, West Germany). *American Astronautical Society, Goddard Memorial Symposium, Washington, D.C., Mar. 28-30, 1979, Paper 79-068.* 12 p.

The approach used in the financing of projects carried out by the European Space Agency (ESA) is discussed and contrasted briefly with methods used to finance space-related projects in the U.S. Apart from bridging loans, notably for the Ariane launcher and Spacelab projects, all space activity in Europe has been undertaken in the public sector only. Expenditures for production activities to be undertaken by the ESA on behalf of third parties are not covered by the ESA budget. An expanded role for private sources in projects involving the commercial exploitation of Spacelab, launchers and telecommunications satellites is discussed. C.K.D.

A79-37298 A multivariate approach to perceived innovation in R&D subsystems. J. G. Paolillo (Wichita State University, Wichita, Kan.) and W. B. Brown (Oregon, University, Eugene, Ore.). *IEEE Transactions on Engineering Management*, vol. EM-26, May 1979, p. 36-39. 8 refs.

This study proposes and tests a model concerning perceived innovation in the R&D subsystems of six organizations. Data from a sample of 102 research scientists, representing six industries, are analyzed. It was found that perceived R&D subsystem innovativeness was significantly influenced by the climate of the R&D subsystem, the R&D subsystem structure, and the personal characteristics of the R&D personnel. Managerial implications of the findings and suggestions for future research are discussed. (Author)

A79-39876 Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. Symposium sponsored by IEEE, ASQC, IES, AIAA, ASME, AIIE, S.O.L.E., SSS, and SRE. New York, Institute of Electrical and Electronics Engineers, 1979. 409 p. $18.

The papers presented here discuss studies on managing R & M, life-cycle costing, R & M warranties, product liability, energy system reliability, replacement and repair, maintainability, R & M case histories, software reliability, reliability theory, and reliability growth. Individual topics studied include design or reliability acceptance sampling plans based on prior distributions, the AN/UYK-20 computer production reliability test, engineering risk reduction in satellite programs, RELSIM - a systems reliability simulation code, analysis of the incidence of unscheduled maintenance, and graphic analysis of repairable systems. P.T.H.

A79-39877 Simulating multi-skill maintenance - A case study. B. A. Basker (Plessey Assessment Service, Ltd., Fareham, Hants., England) and T. M. Husband (Loughborough University of Technology, Loughborough, Leics., England). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 7-12.

The following type of problem is considered. A company makes machinery of three different types and provides maintenance for all three. The members of the maintenance crew are each specialized to a given machine type, and two questions arise: (1) what is the ideal number of servicemen under the single-skill organization of maintenance, and (2) what is the ideal number of servicemen if workers could become multiskilled (i.e., be able to service more than one machine type). These questions were studied given the demands made on the company by customers, and Monte Carlo simulation was employed. The results show how waiting time distributions change with skill flexibility. The optimal crew mix to meet a specified level of customer service was established. The benefits of multiskill organization are clearly an improvement in customer service and an increase in maintenance effectiveness. P.T.H.

A79-39878 Dollar-based specification of RAM. J. D. Patton, Jr. (Patton Consultants, Inc., Geneseo, N.Y.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 18-22. 8 refs.

The paper describes the process of dollar-based specification, allocation, and prediction of RAM (reliability, availability, and maintainability). Ways of choosing a dollar figure of merit are discussed, and a systematic way of keeping track of maintainability allocation is shown. Main inputs for prediction and the structure of the prediction process, which provides the check and control to assure that the budgeting process has been achieved, are described. P.T.H.

A79-39885 Treatment of uncertainty in life cycle costing. G. R. McNichols (Management Consulting and Research, Inc., Arlington, Va.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 56-61. 9 refs.

A quantitative means of dealing with uncertainty in life cycle cost estimating is proposed. Three numbers are associated with each component of a system: the low estimate (L), the most likely estimate, (M), and the high estimate (H) of the cost of the component. The values of L, M, and H are subjective, based on past experience and technical knowledge. These are also associated with the probability that the cost will be lower than L and the probability that it will be higher than H. The value of M is assumed to have a Weibull distribution, for which the parameters are calculated on the basis of L, M, H, and the two mentioned probabilities. A statistical summation procedure is then applied to obtain the most likely value for the total cost. P.T.H.

A79-39886 **Preparation for LCC proposals and contracts.** B. A. Schmidt (E-Systems, Inc., Montek Div., Salt Lake City, Utah). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 62-66. 7 refs.

The paper identifies some of the more usual contract requirements for life cycle cost (LCC) and the obligations of a contractor preparing for a LCC program. This review leads to the outline of a seven-step approach to incorporate LCC into the planning process for proposals and contracts. The steps are the following: organize for LCC, develop LCC background information, analyze requirements for LCC response, plan for the LCC technical proposal, plan for the LCC cost proposal, plan for the LCC risk identification and analysis, and plan for LCC goal achievement. P.T.H.

A79-39896 # **Rational risk assessment for defense system safety.** P. E. Vanden Dries (USAF, Cryptologic Depot's Engineering Laboratory, San Antonio, Tex.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 165-168.

A risk assessment procedure in compliance with DOD Military Standard 882A is presented. This procedure, intended to acquire maximum system safety at minimum cost, ranks potential hazards by probability and severity. Advantages and disadvantages of absolute and relative ranking of hazards and misuse of ordinal data in hazard ranking are discussed, the latter noting the USAF system safety course. Three ranking tools are studied. The Risk Assessment Matrix is a geometric arrangement of the identified hazards within a grid established by the two parameters, severity and probability. The remaining events can then be sorted by the use of the Substitution Diamond which graphically establishes greater than-less than relationships among the relevant combinations of severity and probability. Third is the Ranking Tree which is constructed using the paths of hierarchy established by the Substitution Diamond. In conclusion it is stressed that to be rational, risk assessment's foundation must be on basic knowledge and tenets. M.E.P.

A79-39902 **Provisioning data quality control criteria - A Delphi survey.** W. W. Chang and R. S. Morris (Northrop Corp., Aircraft Group, Hawthorne, Calif.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 212-220.

The paper describes the introduction of the Delphi technique to a product support organization and the resulting consensus of opinion on quality control criteria for provisioning data. Attention is given to the procedure and the results of a four-round Delphi survey. In addition to the quantification of the quality control criteria, key personnel are exposed to the logic supporting various points of view in an objective manner during the four rounds of the Delphi survey. The participants gained valuable understanding of the requirement for provisioning data quality control. The potential user of the results must be cautioned against the blind interpretation of the final 'consensus' as the 'absolute universal truth'. S.D.

A79-39903 **Spare/Repair parts provisioning recommendations.** L. R. Murray and R. S. Morris (Northrop Corp., Aircraft Group, Hawthore, Calif.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 224-230.

This paper describes the use of a spares utilization simulation model developed for the purpose of recommending a more nearly optimal spares lay-in that can be obtained by use of the standard USAF provisioning algorithms. The advantage of the simulation feature permits the analyst to investigate alternate provisioning conditions and to select nearly optimum quantities of high-value spares in the standard tri-level environment (Organization, Field, and Depot). For example, variations in the hardware delivery rates and resupply pipeline times may be simulated and measured for impact on the entire product support system. Base stock level is the criterion chosen to evaluate support system effectiveness. The simulation produces base stock level monthly for seventy-two months using Monte Carlo methods. This process is replicated fifty times and the resulting data are plotted in a scattergram of base stock level versus time. The graphical result can be produced rapidly using the FORTRAN simulation which requires approximately 11 seconds of CPU time. Several examples are presented in the paper illustrating the use of the model in developing spares lay-in recommendations. (Author)

A79-39904 **Identifying and evaluating R & M investments for fielded military equipment.** R. M. Genet, W. S. Demmy (USAF, Acquisition Logistics Div., Wright-Patterson AFB, Ohio), T. R. Edison (Wright State University, Dayton, Ohio), C. J. Coleman, and T. D. Meitzler (USAF, Institute of Technology, Wright-Patterson AFB, Ohio). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 243-246. 5 refs.

The opportunities and difficulties involved in implementing reliability and maintainability (R&M) on equipment in fully deployed military aircraft are presented. Current approaches in identifying cost-effective candidates for R&M improvements with potentially high investment returns are discussed. A method of evaluating the improvements realized from past R&M modifications is described, together with the suggestions to improve the identification process to increase the percentage of successful projects. The results of the automated return-on-investment screening show that there are potentially several billion dollars worth of benefits in reduced cost and increased availability in currently fielded aircraft at good return-on-investment ratios, and that most of the higher ratio items are valves, actuators, fuel quantity indicators and similar mundane items rather than jet engines, radar sets and other major items. A.T.

A79-39905 **Availability - A low-density deployment case study.** R. M. Fabbro (Logistics Management Institute, Washington, D.C.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 247-253.

A spares optimization model which relates design and logistics parameters to readiness and cost was applied to a low density deployed system to show that certain planning policy and design tradeoffs can meet availability objectives while reducing the spares costs, or increase system effectiveness for a fixed investment level. Low density systems are planned for deployment in small, widely dispersed detachments, and the factors that make their deployment hard to support, a demand for high operational availability, high utilization rates, limited local maintenance and lack of 'economies of scale' are discussed. The model is applied to the case study of a helicopter, considering deployment density, density and reliability, utilization rate, consolidated support with other systems, and avionics reliability. It is concluded that low density support is much more expensive than conventional support, and much more sensitive to changes in operational objectives, that 'economies of scale' problems may be mitigated through consolidated support, and that other problems may be mitigated through careful support planning. A.T.

A79-39906 **Support cost comparison methodology.** M. E. Alarcon, Jr. and L. M. Donaldson (Northrop Corp., Hawthorne, Calif.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings

New York, Institute of Electrical and Electronics Engineers, 1979, p. 254-261.

Development of cost estimating methodology for logistics support alternatives to the U.S. military services maintenance concepts for Foreign Military Sales environment is presented with its application in a cost trade-off study for an aircraft radar system. Maintenance support concept designed into a weapons system, provisioning data file, and support cost model are discussed. The support cost model was applied to determine the least costly maintenance system for the fire control radar. Several alternative support concepts ranging from full depot level repair capability to a limited intermediate level capability were quantified by altering the Support Equipment for the radar's test and repair. The support concepts determined to be the most feasible were full depot level and intermediate level repair capability and support costs were computed for six different aircraft fleet sizes. It was concluded that a cost effective support concept is a function of the fleet size, and that when cost effective support is attained through the reduction of repair capability the customer forfeits a degree of self-sufficiency. A.T.

A79-39916 **A reliability growth management approach.** D. J. Simkins (IBM Corp., Federal Systems Div., Owego, N.Y.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 356-360. 8 refs.

This paper describes a real-time reliability measurement, tracking, and control approach that can be implemented during development of a major weapon system. This approach provides real-time visibility and accountability to quickly check for nonconformance to reliability requirements. It allows a multitier growth tracking (equipment, subsystem, and system) and permits multitier confidence band construction. Finally, it incorporates data from equipments that develop at different rates and over different time periods and accounts for product degradation. (Author)

A79-39922 **No-growth growth curves.** J. M. Clarke (General Electric Co., Aerospace Electronic Systems Dept., Utica, N.Y.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 407-412.

Some misconceptions concerning reliability growth are examined. Case histories of reliability TAAF (test-analyze-and-fix) and demonstration tests, wherein analysts have misinterpreted test results and concluded that growth is occurring when in fact it is not are reviewed. These examples are used to illustrate the pitfalls that can be encountered and to advocate more careful definition of reliability growth. B.J.

A79-39923 # **Warranties - The easy way out.** J. R. Anderson (U.S. Navy, Pacific Missile Test Center, Point Mugu, Calif.). In: Annual Reliability and Maintainability Symposium, Washington, D.C., January 23-25, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1979, p. 413-415.

The application of reliability warranties to Navy guided weapons is examined. Analysis techniques to determine the compatibility of the warranty concept for a weapon system are presented. The evaluation concludes that it is possible for the warranty to provide a counterproductive result, i.e., lower reliability at high cost. (Author)

A79-39998 **Recent class action litigation against air carriers.** T. A. Dickerson. *Air Law,* vol. 4, no. 2, 1979, p. 58-69. 42 refs.

The types of allegations made against air carriers by dissatisfied consumers are examined. Air carriers have been named as defendants for two reasons: (1) their primary responsibility for overbooking, flight delays, and lost baggage, (2) their secondary responsibilities for hotel switching, non-performance, cancellations, substitutions of inferior services, and physical injuries. Cases cited include flight delays caused by a blizzard considered an Act of God, a lost baggage case involving adherence to CAB or Warsaw Convention tariffs, and hotel switching involving substitutions of inferior and substandard accommodations. It is concluded that because tour operators are frequently out of business by the time a judgment is obtained, the air carrier is left to carry the load and thus should be careful to disclaim liability for defaults over which it has no control. M.E.P.

A79-40226 **Improving performance in rapid transit systems.** H. Hunt (Kaiser Engineers; Daniel Mann, Johnson, and Mendenhall, Baltimore, Md.). *(American Society of Civil Engineers, Convention and Exposition and Continuing Education Program, Chicago, Ill., Oct. 16-20, 1978.) ASCE, Transportation Engineering Journal,* vol. 105, July 1979, p. 393-399.

Recognized reliability and maintainability techniques developed by the aerospace industry are modified for application to the rapid transit industry. The approach presented uses the term operational dependability, which is defined as the probability that trains shall be available for service upon demand and then complete their scheduled operations. Operational dependability is expressed quantitatively as the product of availability and reliability. Evaluation of existing and proposed transit systems indicate that through the application of design techniques and operating strategies, the operational dependability can be significantly increased. Quantum improvements in the state of the art are not required. However, increased cooperation between manufacturers, designers, and those responsible for specification preparation is necessary. S.D.

A79-40420 # **A technical and economic evaluation of the Baltimore Landgard demonstration.** A. J. Helmstetter (Systems Technology Corp., Xenia, Ohio) and D. B. Sussman (U.S. Environmental Protection Agency, Washington, D.C.). In: Energy conservation through waste utilization; Proceedings of the Eighth Biennial National Waste Processing Conference, Chicago, Ill., May 7-10, 1978. New York, American Society of Mechanical Engineers, 1978, p. 465-474; Discussion, p. 475; Authors' Reply, p. 475. U.S. Environmental Protection Agency Contract No. 68-01-4359.

Results of a technical and economic evaluation of the Baltimore Landgard Plant, a full-scale processing plant designed to demonstrate the feasibility of using pyrolysis as an integral step in the recovery of energy, glassy aggregate, and magnetic metals from a mixed municipal solid waste stream, are presented. As designed, the unit was to process 1000 tons per day of solid waste and yield 80 tons of carbon char for landfill, 70 tons of ferrous metal, 169 tons of glassy aggregate for use in road building, and 4.8 million lbs of steam, with the remaining 80 tons of residue going to landfill. The off-gas from the pyrolysis reaction was burned in a high temperature afterburner, discharged through waste heat boilers and cleaned by a wet scrubber before release to the environment. However, numerous difficulties were encountered in operation, including problems with kiln control, residue slagging in the kiln, refractory failures, wastage of fans and pumps, ram feeder jams, slag tap hole pluggage, and poor performance of the shredded waste storage and recovery systems. These problems are discussed, and a summary of heat and material balance for the process is presented together with an economic evaluation of the plant. Although the technical feasibility of the process was demonstrated, the net cost of operations was shown to exceed $49.00 per ton of waste input. C.K.D.

A79-40486 # **Parts tracking and engine history recording for on-condition maintenance.** G. I. Walker and R. M. Donovan (General Electric Co., Aircraft Engine Business Group, Lynn, Mass.). *AIAA, SAE, and ASME, Joint Propulsion Conference, 15th, Las Vegas, Nev., June 18-20, 1979, AIAA Paper 79-1280.* 12 p. USAF-supported research.

The Parts Life Tracking System (PLTS) used to manage on-condition maintenance of the TF34-100 engine in USAF/A10

aircraft is described. The PLTS includes a parts-tracking system (PTS) and an engine time-temperature recorder (ETTR) system. The central data base includes a parts master file encompassing all designated parts entered into the system either as spares or as part of an engine, and an engine master file section containing a record of the engine data and data for all designated parts in that engine. The PLTS requires data from the mechanic responsible for changing parts (engine serial number, part serial number, location of part and date) and periodic reading and recording of information taken from the signal to the aircraft cockpit Inter-Turbine Temperature and stored in the ETTR system. The ETTR parameters used in logistic analysis include events at 550 C, events at 790 C, events at 810 C, time at or above 790 C, time at or above 810 C, and engine operating hours. The PLTS provides repair facilities with an accurate listing of the estimated life remaining on all designated parts in the engine and also of the spare parts available for installation. C.K.D.

A79-40676 Materials problems in gas turbine engine technology; Colloquium, Munich, West Germany, October 27, 28, 1977, Report (Werkstofftechnische Probleme bei Gasturbinentriebwerken; Kolloquium, Munich, West Germany, October 27, 28, 1977, Bericht). Colloquium sponsored by the Motoren- und Turbinen-Union München GmbH. Edited by W. Hansen and P. Esslinger (Motoren- und Turbinen-Union München GmbH, Munich, West Germany). Karlsruhe, Werkstofftechnische Verlagsgesellschaft mbH, 1978. 262 p. In German.

In this examination of gas turbine materials, attention is given to materials technology research and development, service life determination (using turbine blades as an example), and considerations of failure analysis and quality assurance (using turbine disks as an example). Papers are presented on such topics as service life prediction for heat-resistant materials, high-integrity casting of turbine blades of high thermal stability and long service life, determination of safety factors, and materials quality assurance for turbine disks. B.J.

A79-40678 Advances in materials technology through the BMFT - Goals, problems and main points of interest (Förderung der Werkstofftechnik durch das BMFT - Ziele, Probleme, Schwerpunkte). H. G. Sievers (Bundesministerium für Forschung und Technologie, Bonn, West Germany). In: Materials problems in gas turbine engine technology; Colloquium, Munich, West Germany, October 27, 28, 1977, Report. Karlsruhe, Werkstofftechnische Verlagsgesellschaft mbH, 1978, p. 21-28. In German.

Consideration is given to the planning and organization of R&D programs relating to aircraft engine materials. The goals of such programs are discussed and ways to stimulate international cooperation in this field are examined. Problems of program selection, financing, prioritization, and execution are considered. B.J.

A79-40701 Spacelab: Utilization and experimental design; Course on Space Technology, Toulouse, France, May 22-June 2, 1978, Proceedings (Spacelab: Utilisation et conception d'expériences; Cours de Technologie Spatial, Toulouse, France, May 22-June 2, 1978, Proceedings). Toulouse, Centre National d'Etudes Spatiales, 1979. 612 p. In French and English.

A series of papers concerning the Spacelab, developed for deployment by the Space Shuttle, is presented. A first group of papers examines the transport system to be used with Spacelab: the Space Shuttle, ground support system, and provisions for transport between the Shuttle orbit and another orbit. Subsequently problems specific to Spacelab are discussed, including flight mechanics (with special attention to attitude control), data processing and telecommunications, and compatibility with the space electromagnetic environment. Attention is given to the limits imposed on Spacelab experiments by the above factors. Finally, the reliability, quality, and safety of Spacelab are considered, and the different phases of its development are presented. C.K.D.

A79-40725 Safety, reliability and quality control methods and procedures (Méthodes et procédures de securité, fiabilité et assurance qualité). M. D. Bringel (Centre National d'Etudes Spatiales, Toulouse, France). In: Spacelab: Utilization and experimental design; Course on Space Technology, Toulouse, France, May 22-June 2, 1978, Proceedings. Toulouse, Centre National d'Etudes Spatiales, 1979, p. 403-425. In French.

The approaches used to ensure an optimal level of safety and reliability in Spacelab experiments are discussed, with special attention to the idenfification and evaluation of potential hazards at different stages of design and development. The organization of Spacelab projects in phases is described. The definition of safety objectives for different types of projects is discussed. The importance of undertaking safety analysis when a project is in embryo stages is emphasized. C.K.D.

A79-41210 # Forward-looking financial planning. K.-E. Reuter (ESA, Directorate of Planning and Future Programmes, Paris, France). *ESA Bulletin,* no. 18, May 1979, p. 11-16.

The financial planning of future activities for ESA is discussed. Past expenditures of ESA and its predecessors, broken down by program and member state, illustrate the continuity of the level of European financial involvement. Financial requirements of ongoing programs are summarized, and the amount available for future programs through 1984, assuming a future continuity of effort, is indicated. Two plans for future earth observation, telecommunications and space transportation programs at different levels of commitment are outlined. Aspects of the economic allocation of agency personnel and facilities to specific programs are considered, as well as the effects of inflation and currency fluctuations on program planning. A.L.W.

A79-41211 # Investment planning in the agency. H. Broberg (ESA, Directorate of Planning and Future Programmes, Paris, France). *ESA Bulletin,* no. 18, May 1979, p. 17-21.

The planning of investments in long-term systems within the European Space Agency is discussed. The positive and negative aspects of investment are recalled, and a systems model of cost centers used by ESA is introduced. The integrated investment plans of the agency are explained as being closely linked to system acquisition plans in order to keep expenditures under control and to coordinate investments among different systems. Investment packages are formulated as small projects in themselves, in which the time schedules of the investment projects are linked to the first user of the system. The investment plan submitted by ESA to its council for the years 1978 through 1983 for the major service systems employed by ESA (checkout equipment, environmental testing systems, spacecraft ground support systems, and computer equipment) is summarized and investment aspects of the use of external, national test facilities by ESA are considered. A.L.W.

A79-41212 # GEPSY - An information system for use in planning and decision making (GEPSY - Un systéme d'information au service de la planification et de l'élaboration des décisions). G. Coste (ESA, Directorate of Planning and Future Programmes, Paris, France). *ESA Bulletin,* no. 18, May 1979, p. 22-25, 71. In French.

The GEPSY (General Planning System) information system, designed to aid in the financial management of ESA, is presented. GEPSY consists of a data bank comprising approximately 1500 items of global data connected with the payment schedules of the agency and programs within it. Examples of potential applications are given, and its function as an instrument of interaction between levels of planning and the level of project execution is noted. Weaknesses of the system and means of correcting them are discussed. It is concluded that when the weaknesses are overcome, GEPSY will prove to be an instrument capable of simulating the present and future expenses of the agency, thus providing a means for informing management decisions. A.L.W.

A79-41213 # **ESA's computerised medium/long-term planning system.** G. Niederau (ESA, Directorate of Planning and Future Programmes, Paris, France) and P. Brunt (General Technology Systems, Ltd., London, England). *ESA Bulletin,* no. 18, May 1979, p. 26-29.

A computerized system to provide assistance in the medium- and long-term management, planning and assessment of ESA programs has been developed. Activities to be considered by the software fall into the two broad subdivisions of accounting, planning and forecasting of budgets, costs, financial margins and programs, and of benefits and returns, including market-capture analysis. The planning system is programmed into eight independent subprograms linked through extensive data files, which must be updated regularly. The system represents a comprehensive and powerful tool for elaborating proposals for future programs and evaluating different program possibilities, allowing the user to devote more time to the conceptual aspects of planning. A.L.W.

A79-41215 # **Planning for the next scientific projects.** M. Delahais and D. Dale (ESA, Directorate of Scientific Programmes, Paris, France). *ESA Bulletin,* no. 18, May 1979, p. 55-60.

The methods for planning ESA scientific space exploration projects are illustrated and future projects under consideration are outlined. The responsibility for the planning and execution of scientific projects falls within the Directorate of Scientific Programs, with the Science Planning Group and the Future Projects Studies Office as main participants in the preliminary assessment of proposed missions, and detailed feasibility studies, respectively, of the planning process. The planning cycle of a project typically lasts about two years and can be divided into proposal, assessment and study stages, leading to the submission of the project to the Science Program Committee for approval. Options currently under study for selection in 1980 and 1981 consist of a third GEOS spacecraft for lunar research and/or exploration of the earth's distant magnetotail, a Halley's Comet probe in collaboration with NASA, an astrometry satellite, and an all-sky survey satellite intended to map brightness distributions in the range of 15 to 1000 A. A.L.W.

A79-41227 Future assurance of industry through research and development (Zukunftssicherung der industrie durch Forschung und Entwicklung). W. Dettmering (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Aachen, West Germany). *(Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Festveranstaltung, Bonn, West Germany, Mar. 14, 1979.) DFVLR-Nachrichten,* June 1979, p. 7-11. In German.

It is shown that the strength and stability of the German aerospace industry can be maintained through innovation, technology transfer, and basic research. These three concepts of R&D are reviewed and attention is also given to essentials of system research and to a comparison of research capacities of several German industries. B.J.

A79-41373 Application of a computerised resource analysis model to used tyre disposal. J. W. Bryant (Sussex, University, Brighton, England). *Resource Recovery and Conservation,* vol. 4, May 1979, p. 69-82. Research supported by the Leverhulme Trust Fund.

A practical systems-based methodology for the investigation of the environmental impact of alternative resource-recovery strategies is described in application to the problem of used car-tire disposal. The study involved the construction of a computer-based model of the car tire system and the use of this model to examine various scenarios. A short-term plan for dealing with the car-tire disposal problem in the United Kingdom is suggested from the model. This involves placing a greater emphasis on the recycling of reusable tire carcasses and the use of reclaimed rubber as well as the increased use of incinerators to generate power from those used tires that would otherwise be discarded. The methodology itself is of quite general application and could be used in many other areas for resource or environmental impact analysis. (Author)

A79-41647 # **GERT analysis of chain sampling inspection plans.** H. Ohta (Osaka Prefecture, University, Sakai, Japan). *Osaka Prefecture, University, Bulletin, Series A - Engineering and Natural Sciences,* vol. 27, no. 2, 1978, p. 167-174. 17 refs.

This paper presents a GERT (Graphical Evaluation and Review Technique) analysis of chain sampling inspection plans. The chain sampling inspection plans are found useful in application to product characteristics involving destructive or expensive tests. The analysis by GERT has the advantage of clear visual representation of inspection systems and reduction in calculation of the statistics which give us the useful information for evaluation of the operating characteristics of the chain sampling inspection plans. (Author)

A79-41648 # **Cost-effectiveness analysis of material testing in structural design.** H. Nakayasu, Y. Murotsu, K. Mori, and S. Kase (Osaka Prefecture, University, Sakai, Japan). *Osaka Prefecture, University, Bulletin, Series A - Engineering and Natural Sciences,* vol. 27, no. 2, 1978, p. 175-186. 11 refs. Research supported by the Ministry of Education, Science and Culture of Japan.

This paper deals with problems encountered in designing structural systems on the basis of reliability analysis. The first is how to select the underlying distribution of data of material strengths to which the structural reliability is sensitive. The second is the determination of the optimum sample size in material testing from economical considerations. The present work describes illustrative design problems which show the effect of selection of distributions and determination of optimum sample size in view of the resultant costs of structure and material test. (Author)

A79-41649 # **A preliminary test of significance for the extreme-value distribution.** M. Tsujitani, H. Ohta, and S. Kase (Osaka Prefecture, University, Sakai, Japan). *Osaka Prefecture, University, Bulletin, Series A - Engineering and Natural Sciences,* vol. 27, no. 2, 1978, p. 187-193. 13 refs.

The paper presents a new scheme for estimating the variance of the extreme-value distribution which is based on a preliminary test of a two-sided hypothesis on the scale parameter in some life-test data. Expressions for the bias and mean-square error of the proposed estimator are derived. B.J.

A79-41737 Cruise missile logistics support simulation model. D. Ingerman (ARINC Research Corp., Annapolis, Md.) and C. M. Marshall (U.S. Navy, Washington, D.C.). In: Annual Simulation Symposium, 12th, Tampa, Fla., March 14-16, 1979, Record of Proceedings. Symposium sponsored by ACM, IEEE, and SCS. Tampa, Fla., Annual Simulation Symposium; Long Beach, Calif., IEEE Computer Society, 1979, p. 305-314.

This paper describes a simulation model developed as a tool for designing a logistics system that will be used to support the deployment of Sea Launched Cruise Missiles (SLCM). The SLCM deployment scenario is complicated by a number of independent factors that influence each other to create an enormous resource-management problem. A GPSS model was implemented to assist in evaluating alternative strategies for dealing with the problem. (Author)

A79-43228 The enigma of the eighties: Environment, economics, energy; Proceedings of the Twenty-fourth National Symposium and Exhibition, San Francisco, Calif., May 8-10, 1979. Books 1 & 2. Symposium sponsored by the Society for the Advancement of Material and Process Engineering. Azusa, Calif., Society for the Advancement of Material and Process Engineering (Science of Advanced Materials and Process Engineering Series.

Volume 24, Book 1 and Book 2), 1979. Book 1, 858 p.; Book 2, 778 p. Price of two books, $56.

The proceedings focus on developments in materials technology for energy and environmental problems of the 1980s. Particular consideration is given to nonterrestrial material processing and manufacturing of large space systems, sandwich constructions for aircraft and communications, materials for airline safety, thermal coatings for missile warhead fire protection, and satellite applications of metal matrix composites. Papers are also presented on polyimide/graphite, aluminum/SiC, and fiber reinforced titanium composites, pressure vessel steels for coal gasifiers, environmental effects of composite material processing, adhesive bonding of sandwich structures, heatshield materials for rocket launching systems, and the effects of particulates on solar cells. A.T.

A79-43271 Aircraft passenger seat material development for airline fire safety. E. L. Trabold (Douglas Aircraft Co., Long Beach, Calif.). In: The enigma of the eighties: Environment, economics, energy; Proceedings of the Twenty-fourth National Symposium and Exhibition, San Francisco, Calif., May 8-10, 1979. Book 1. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1979, p. 599-610.

A program to establish a basic data base for selection of improved fire-resistant aircraft passenger seat materials is described. The individual material screening program is briefly outlined. The functional layers of future seat designs are identified and related key requirements suggested. The main focus is on heat-release-rate determinations for multilayer specimens. Selected materials for multilayer tests are described and test results reported herein. (Author)

A79-43448 The NASA budget - Fiscal years 1979-80. D. Baker. *Spaceflight,* vol. 21, Aug.-Sept. 1979, p. 339-348.

The impact of the U.S. federal budget on funding for the Space Shuttle program is discussed. It is contended that many important objectives in space science and technology planned for the 1980s will be frustrated due to tight fiscal constraints being placed on NASA. It is suggested that more money is required to see the Space Shuttle over development hurdles and this will have its own impact on the budgetary format. B.J.

A79-43721 Policies and procedures for transit service development. R. F. Kirby and M. A. Green (Urban Institute, Washington, D.C.). *Traffic Quarterly,* vol. 33, July 1979, p. 413-427. 20 refs. Research supported by the U.S. Department of Transportation.

Techniques and procedures currently used in planning the development of transit services are reviewed. Evaluation methods and criteria used to coordinate internal management functions and facilitate the involvement of community groups in transportation planning are examined for four cases: the Queen City Metro in Cincinnati, Ohio, the Massachusetts Bay Transportation Authority in Boston, Massachusetts, the San Diego Transit Corporation in San Diego, California, and London Transport in London, England. Possible means of incorporating these approaches into a framework for comprehensive public transportation planning and decision making along the lines envisaged in the 1975 joint planning regulations of the Federal Highway Administration and the Urban Mass Transportation Administration are considered. C.K.D.

A79-43722 Accessibility measures used to appraise transport system performance. A. Polus and M. Kumove (Technion - Israel Institute of Technology, Haifa, Israel). *Traffic Quarterly,* vol. 33, July 1979, p. 429-442. 19 refs.

The concept of accessibility as defined in traffic engineering, transportation planning, environmental planning, urban economics and comprehensive urban planning is examined, and the models and measures currently used in each of these disciplines to describe and evaluate accessibility are presented. Obstacles to the development of a common measure of accessibility are discussed. C.K.D.

A79-43723 An evolving image of long-range transportation planning. D. F. Schulz (Southeastern Wisconsin Regional Planning Commission, Wis.), J. L. Schofer (Northwestern University, Evanston, Ill.), and N. J. Pedersen (JHK Associates, Alexandria, Va.). *Traffic Quarterly,* vol. 33, July 1979, p. 443-457. 20 refs.

Changes in the functions and perspectives of long range urban transportation planning (LRP) are discussed. Emphasis is placed on the concept of long range planning as a dynamic framework defining possible paths to possible futures and providing a background for short-term decision making. Such problems as forecasting alternative futures, generating information on benefits and costs of separable components of a transportation plan, analyzing implementation capability, and subregional focusing of plans are considered. Guidelines for the reorganization of some metropolitan planning organizations are suggested. The relationship of metropolitan planning organizations to implementing agencies is discussed. C.K.D.

A79-47003 Dynamic model of multiproduct production enterprise. M. M. Rafikov and T. K. Sirazetdinov. *(Aviatsionnaia Tekhnika,* vol. 21, no. 2, 1978, p. 74-82.) *Soviet Aeronautics,* vol. 21, no. 2, 1978, p. 59-66. Translation.

A mathematical model, consisting of a system of differential and algebraic equations and inequalities, is proposed for an industrial plant. The production process is treated in terms of three different but related factors: the resources and means of production; materials and power consumption; and the labor force. Each of these factors is analyzed, and equations describing the development and status of each factor are derived. The interaction of the three factors is examined, and the conditions reflecting the constraints on production are formulated. The application of the model is illustrated by an example. V.P.

A79-47072 European technology for obtaining energy from solid waste. Edited by D. J. De Renzo. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 34; Pollution Technology Review, No. 54), 1978. 299 p. $39.

Western Europe is definitely the leader in the field of energy recovery from the combustion of municipal solid waste. For each country a national overview is given, followed by a description of particularly significant developments and case histories: household sorting and collection methods, combustors, furnaces, incinerators, air pollution control, latest plant designs, operation and economics. The case studies concern Toulouse-Le Mirail, France; Geneva-Cheneviers, Switzerland; Korsor, Denmark; Munich, Germany; and Brive, France. A summary of key findings is included along with maps and a tabulation of the European systems. S.D.

A79-47910 # Geometric data transfer. W. L. Howard (Rockwell International Corp., El Segundo, Calif.). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1844.* 5 p.

Coordination of an engineering-manufacturing agreement as to data format, procedures, and schedules for geometric data transfer within two separate companies is shown. Consideration is given to the methods used in gaining agreement, examples of problems overcome, and procedures used to document and implement solutions. Sample model drawings were constructed and then redrawn several times in accordance with requirements of design management and manufacturing. Manual drawing release and automated drawing release are discussed with emphasis placed on the use of the CADAM model. V.T.

A79-48612 # **Common avionics on the Ground Launched Cruise Missile Program.** D. A. Warner (USAF, Aeronautical Systems Div., Wright-Patterson AFB, Ohio). In: NAECON 1979; Proceedings of the National Aerospace and Electronics Conference, Dayton, Ohio, May 15-17, 1979. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 193-195.

It is noted that a major goal of the joint cruise missile project is commonality. Attention is given to issues which have resulted from the pursuit of this goal and to the different requirements for the Ship Launched Cruise Missile (SLCM), the Air Launched Cruise Missile (ALCM), and the Ground Launched Cruise Missile (GLCM). An example is the fact that new computer technology results in a performance/commonality/cost trade-off. It is noted that the issues examined have all evolved into trading the goal of commonality with the usual objectives of cost, performance, and schedule. It is concluded that strong management is needed to bring to a successful conclusion these program trade-offs. M.E.P.

A79-48619 # **Simplified procedures for performing life cycle cost analyses.** B. S. Mills (USAF, Aeronautical Systems Div., Wright-Patterson AFB, Ohio). In: NAECON 1979; Proceedings of the National Aerospace and Electronics Conference, Dayton, Ohio, May 15-17, 1979. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 290-295.

The use of cost models has previously been limited mostly to large scale computers. Handheld calculators are now available with adequate program and memory capacity to accommodate many cost models. This capability has provided a new and valuable tool for making fast and convenient cost analyses of new equipments. Included in this capability is the opportunity for making life cycle cost analyses of design and support options. The key advantage of using handheld programmable calculators to perform life cycle cost analyses is that they are an extremely powerful tool that can drastically reduce the feedback loop for information on life cycle cost impacts to the people who need this type of information the most. (Author)

A79-48637 **Potential effects of standardization on avionics software life-cycle cost.** R. N. Schane, J. R. Williams (Logicon, Inc., Dayton, Ohio), and M. F. Yachowsky (USAF, Aeronautical Systems Div., Wright-Patterson AFB, Ohio). In: NAECON 1979; Proceedings of the National Aerospace and Electronics Conference, Dayton, Ohio, May 15-17, 1979. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 558-567. 12 refs. Contract No. F33657-77-C-0152.

Quantitative models are developed to evaluate the potential effects of standardization on avionics software life-cycle cost. Four candidate standardization areas are investigated: computer-language standardization, standard cross-training of maintenance personnel, standard GFE support hardware and software, and standard interfaces. Standardization-cost-savings models are defined relative to the baseline cost of a hypothetical, non-standardized avionics system. The baseline system is defined to include nine subsystems, each with an embedded computer and an operational flight program (OFP). Life-cycle costs of the baseline system are computed using a detailed rule-of-thumb model constructed as a composite of current cost data and models from the literature. (Author)

A79-48867 **AUTOTESTCON '78; International Automatic Testing Conference, San Diego, Calif., November 28-30, 1978, Conference Record.** Conference sponsored by the Institute of Electrical and Electronics Engineers. New York, Institute of Electrical and Electronics Engineers, Inc., 1978. 415 p. Members, $18.75; nonmembers, $25.

Papers are presented on such subjects as automatic test generation, vehicle testing, software testing and verification, ATE systems, IEEE standards for ATE, nonelectronic testing, and the U.S. Air Force Modular ATE Program. Consideration is also given to military test system requirements, support systems management, software management, testability, ATE for avionics, and ATE software tools. B.J.

A79-48888 **Avionics design for testability - An aircraft contractor's viewpoint.** J. M. Roche (McDonnell Aircraft Co., St. Louis, Mo.). In: AUTOTESTCON '78; International Automatic Testing Conference, San Diego, Calif., November 28-30, 1978, Conference Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1978, p. 286-293.

Designing avionics for testability is the inclusion of design provisions in the avionics to enable test of the performance capability of the avionics, to isolate avionic malfunctions to replaceable elements, and to permit adjustment and alignment of the avionics as may be required. The effective implementation of testability provisions in the design of the Air Vehicle Equipment (AVE) and the Ground Support Equipment (GSE) that comprise the avionics can improve equipment reliability and availability while reducing equipment weight and cost. Accordingly, the operational readiness of the weapon system can be improved by effectively designing the avionics for testability. The aircraft contractor's viewpoint of designing avionics for testability is presented along with the methods and techniques employed by the aircraft contractor to effectively include testability provisions in the avionics. (Author)

A79-49340 # **The application of contractor logistics support to military airplane systems.** L. Hampton. *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1866.* 7 p.

The application of contractor logistics support to military aircraft systems is presented. Contractors' services such as housekeeping and maintenance services are discussed, noting cost savings from a contractor operated supply and spares systems. The C-9 medical evacuation program and the T-43 in-flight training program are described, including base supply, shop and depot engine and airframe maintenance, bench stock, and technical manual maintenance provided by the contractor. The method of payment for the contractor operated and managed base supply known as COMBS is discussed, and it is suggested that management of stock levels is a real test of the supply skills of the COMBS manager. It is concluded that the biggest money savings result from the logistic support contractor providing the spares, availability of technical personnel for troubleshooting, supply of the same maintenance manuals that the contractor provides to commercial customers, and use of the aerospace industry repair capability. A.T.

A79-49475 **A quantitative comparison of energy costing methods.** A. El-Sawy, J. G. Leigh, and R. K. Trehan (Mitre Corp., McLean, Va.). *Energy Systems and Policy,* vol. 3, no. 2, 1979, p. 213-226. 19 refs.

This paper presents a review and analysis of methodologies used for estimating electricity generation costs, with particular reference to geothermal energy, although the main conclusions apply equally to other sources of electricity. The costs projected by the different methods for two test cases are presented, and estimates are made of the sensitivity of the results to critical methodological choices. (Author)

A79-50243 **Spacelab - Europe's first manned spacecraft.** W. Sobotta (ERNO Raumfahrttechnik GmbH, Bremen, West Germany). *British Interplanetary Society, Journal (Space and Education),* vol. 32, Sept. 1979, p. 334-338.

The preparations undertaken in Europe and the US for launching of Spacelab are surveyed. Operational investigations are covered along with the basic requirements of a high degree of re-usability, low ground operation, and great flexibility with regard

to the accomodation of various payloads. Flow patterns developed for the eight flight configurations are divided into the following categories: assembly/disassembly, checkout, activation/deactivation, transportation/handling, maintenance/repair, servicing/deservicing, and housekeeping. Also discussed are the integration activities which involves the integration of the experiments into eventual installation of the Spacelab into the Space Shuttle. Finally, the Spacelab operation is considered, noting the importance of a successful transfer of know-how. M.E.P.

A79-51123 Engineering management in a multiple-/second- and third-level/ matrix organization. H. E. Pywell (General Electric Co., Electronics Systems Div., Syracuse, N.Y.). *IEEE Transactions on Engineering Management,* vol. EM-26, Aug. 1979, p. 51-55.

The functional organization of a company is described together with several forms of matrix organization that have been successfully implemented in the given example. A program-oriented second- and third-level engineering management matrix is presented that was successfully employed in the managing of over 800 engineering personnel on several major programs. The matrix organization introduces a 'horizontal' layer of responsibility to the 'vertically' structured functional organization which divides the total company business into subsets that are project or program oriented. Attention is given to the engineering program group which provides technical interface with the customer and guidance and direction of the functional engineering contributors by controlling the technical specification, costs, and schedule. A summary of multimatrix engineering management responsibilities, advantages, disadvantages, and results is outlined concluding that multiple layer matrix engineering management is successful for large technically complex programs and generally increases the company's effectiveness. C.F.W.

A79-51124 Financial control in project management - A case study. F. V. Van Steelandt and L. F. Gelders (Leuven, Katholieke Universiteit, Louvain, Belgium). *(Institute of Management Sciences, International Meeting, 23rd, Athens, Greece, July 25-27, 1977.) IEEE Transactions on Engineering Management,* vol. EM-26, Aug. 1979, p. 74-77. 16 refs.

This paper deals with the financial control of network projects in a Belgian construction form. An integrated computerized planning and control system is developed based upon network computations and the principles of budgeting and control with cumulative S curves. Budget forecasts are made for each new project. During the execution of the project, feedback information concerning work progress and associated cash flows is provided at the end of each planning period. Special attention is given to the inflation phenomenon. Modifications of the initial plan are taken into account during the execution of the projects. The proposed method controls both expenses and revenues. (Author)

A79-51125 Large engineering project risk analysis. C. B. Chapman (Southampton, University, Southampton, England). *IEEE Transactions on Engineering Management,* vol. EM-26, Aug. 1979, p. 78-86. 7 refs.

The procedures developed during risk analysis for plan approval of an offshore pipeline project in the North Sea are examined. The current status of Synergistic Contingency Evaluation and Response Techniques (SCERT), a systematic approach to planning and financial evaluation of large engineering projects involving significant risks, is described, employing a decision tree/semi-Markov process based on risk mathematics. Four phases are described: scope, structure, parameter, and manipulation and interpretation, which cover all aspects of risk and activity identification as well as the responses to the generated risks. Attention is given to the feature of probablistic decision trees in a fixed-time frame semi-Markov process framework, which uses conditional probability distributions directly as opposed to utility measures. It was determined that there exists a need for a comprehensive view of risks, if risk measurements are to be useful as well as a synergistic framework involving the efficient use of a range of special expertise with a minimum of communication interpretation problems. C.F.W.

A79-51726 Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volumes 1 & 2. Conference sponsored by ACS, AIChE, AIAA, ANS, ASME, IEEE, and SAE. Washington, D.C., American Chemical Society, 1979. Vol. 1, 1219 p.; vol. 2, 1179 p. Price of two volumes, S52.50.

Consideration is given to such topics as solar collectors, solar ponds, solar thermal systems, solar thermal components, OTEC systems, photovoltaic systems, wind power, dessicant cooling, biomass conversion, flywheel energy storage, compressed air energy storage technology, and thermal and magnetic energy storage. Papers are also presented on thermal energy storage for building space conditioning, fuel cells, electric vehicle systems, batteries for electric vehicles, hydrogen energy, coal liquifaction and gasification, fluidized bed processing for energy conversion systems, in situ oil shale and gas technology, geothermal energy, heat engines, and Stirling engine analysis. Finally, attention is also given to space power system requirements, satellite solar arrays, aircraft power systems, space nuclear reactor/isotope power systems, controlled fusion, thermoelectrics, thermionics, and magnetohydrodynamics. B.J.

A79-51971 Energy research and development at the Canada Centre for Mineral and Energy Technology /CANMET/. G. Taylor (Department of Energy, Mines and Resources, Canada Centre for Mineral and Energy Technology, Ottawa, Canada). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1788-1792.

The Canada Centre for Mineral and Energy Technology (CANMET), a research and development arm of the federal Department of Energy, Mines and Resources, has a total staff over 700, including 270 scientists and engineers. The research program, which is administered by a matrix management system, is split about equally between energy and minerals, and is a blend of in-house projects, contract research and joint projects. This paper outlines the energy research program, how it is planned, and how it fits in with Canadian national and regional priorities. Selected highlights are described in coal mining, preparation and conversion; cokemaking; combustion technology; oil sands; renewable and nuclear energy; materials; energy storage and transportation; and technical information. (Author)

A79-52020 # Making the plan work. H. Gehriger (ESA, Projects Control Div., Paris, France). *ESA Bulletin,* vol. 19, Aug. 1979, p. 56-63.

Project planning theory is discussed with reference to the broad long-term goals of such institutions as ESA. Attention is given to such aspects as: (1) systems management, (2) making plans for projects and operations, (3) plan validation and implementation, as well as to feedback of actual performance into the plans. C.F.W.

A79-52021 # The Systems Engineering Department at ESTEC. H. Stoewer (ESA, Systems Engineering Dept., Noordwijk, Netherlands). *ESA Bulletin,* no. 19, Aug. 1979, p. 66-69.

The paper describes the Systems Engineering Department at ESTEC with emphasis on the structure of the Technical Directorate and the distribution of the tasks within it. Attention is given to the organizational and operational aspects of the department and to their various objectives. C.F.W.

A79-53418 Structuring the international marketplace for maximum socio-economic benefits from space industrialization. W.

A. Good (Earth Space Transport Systems Corp., New York, N.Y.), G. S. Robinson (Smithsonian Institution, Washington, D.C.), M. F. Shakun (New York University, New York, N.Y.), and E. F. Sudit (Rutgers University, New Brunswick, N.J.). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-A-14.* 14 p. 86 refs.

The methodology of situational normativism is used to suggest an effective international framework for commercial expansion into outer space, including the necessary resolution of any conflict which may arise. The possible integration of air and space commerce is examined. New commercial space technologies are evaluated in terms of their economic characteristics. Space industrialization is viewed as the process of developing space transport markets. Private common carriers are given the rights and responsibilities for developing various categories of commercial space applications based on economic and technological considerations. The role of government is seen restricted to research and development for the purpose of increasing the technology base, regulation of safety and economic activities, participation in the provision of pure public goods, and provision of supporting services. V.T.

A79-53551 Annual Air Law Symposium, 13th, Dallas, Tex., March 22-24, 1979, Compilation of Papers. *Journal of Air Law and Commerce,* vol. 45, no. 1, 1979. 380 p.

Papers are presented on significant legislative developments in the field of aviation law, maritime aviation losses and conflict of laws, and analysis of aviation liability coverage exclusions. Attention is also given to definition of the design defect in aircraft product liability cases, and tax planning for the ownership and operation of general aviation aircraft. B.J.

A79-53552 Significant legislative developments in the field of aviation law. C. E. Dubuc. *(Annual Air Law Symposium, 13th, Dallas, Tex., Mar. 22-24, 1979.) Journal of Air Law and Commerce,* vol. 45, no. 1, 1979, p. 1-39. 241 refs.

Activity in the U.S. Congress in the area of air law for the period 1977-1979 is reviewed. Consideration is given to such aspects of this activity as products liability, the airline deregulation act of 1978, the airport and aircraft noise reduction bill, and the bill to combat international terrorism. B.J.

A79-53554 Analysis of aviation liability coverage exclusions - A recent case survey. J. H. Ballard and T. H. Chero. *(Annual Air Law Symposium, 13th, Dallas, Tex., Mar. 22-24, 1979.) Journal of Air Law and Commerce,* vol. 45, no. 1, 1979, p. 117-137. 55 refs.

An examination of aviation liability coverage exclusions shows that no two jurisdictions when interpreting the same or a similar exclusion will necessarily agree on its application. The only generality that can be made is that each case stands on its own, based upon its unique factual situation. B.J.

A79-53558 The sale, leasing and financing of aircraft. W. W. Eyer (Perkins, Coie, Stone, Olsen and Williams, Seattle, Wash.). *(Annual Air Law Symposium, 13th, Dallas, Tex., Mar. 22-24, 1979.) Journal of Air Law and Commerce,* vol. 45, no. 1, 1979, p. 217-274. 167 refs.

The paper examines the principal methods by which aircraft are acquired and financed and discusses related business and legal issues. The primary emphasis is on the sale and financing of large commercial transport aircraft operated by air carriers, both domestic and foreign. B.J.

A79-53559 Tax planning for the ownership and operation of general aviation aircraft. W. P. Streng (Southern Methodist University; Counsel, Haynes and Boone, Dallas, Tex.) and S. L. Hancock (Blackwell, Sanders, Matheny, Weary and Lombardi, Kansas City, Mo.). *(Annual Air Law Symposium, 13th, Dallas, Tex., Mar. 22-24, 1979.) Journal of Air Law and Commerce,* vol. 45, no. 1, 1979, p. 275-318. 296 refs.

The various tax effects of aircraft acquisition, operation, and disposition are analyzed. It is found that the majority of tax benefits derived from the operation of an aircraft are limited to aircraft used for business purposes. Consideration is given to what quality of aircraft utilization satisfies a business purpose. B.J.

A79-53560 Recent developments in aviation law. M. J. Foley and R. E. Hulting (Adams, Duque and Hazeltine, Los Angeles, Calif.). *(Annual Air Law Symposium, 13th, Dallas, Tex., Mar. 22-24, 1979.) Journal of Air Law and Commerce,* vol. 45, no. 1, 1979, p. 319-366. 247 refs.

The paper analyzes the most significant United States court decisions during the period March 1, 1978 to January 15, 1979 for the purpose of highlighting new developments and trends in aviation law. Particular emphasis is placed on activities related to the Airline Deregulation Act of 1978. B.J.

A79-53719 # Airbus Industrie's production plan for the 1980s. F. Kracht (Deutsche Airbus GmbH, Munich, West Germany). *Astronautics and Aeronautics,* vol. 17, Oct. 1979, p. 44-47.

According to the present production plan, a single-source modular production plan is designed to minimize delays in A300/A310 production. The entire aircraft is divided into large sections which, when totally outfitted, represent work packages. Each package calls for a full range of production activities (from parts manufacturing to system installation) equivalent to turning out a smaller plane. Airbus Industrie now has a production rate of some 2.5 aircraft per month. It is planned to reach four per month in 1980 and gradually ten per month in 1985. To meet these goals, the manufacturer will double shifts, make investments for tooling, expand facilities, increase the number of wing jigs, and purchase more Super Guppy transporters to ferry large aircraft sections to the final assembly line. V.T.

A79-54378 Computers in Aerospace Conference, 2nd, Los Angeles, Calif., October 22-24, 1979, Technical Papers. Conference sponsored by the American Institute of Aeronautics and Astronautics. New York, American Institute of Aeronautics and Astronautics, Inc., 1979. 484 p. $70.

Papers are presented on high-speed radar processing using CMOS/SOS technology, minimizing air launched cruise missile software life cycle costs, software engineering and standardization at the ESA, design of a highly reliable multiprocessor for space applications, and on the impact of parallel computers on the design of nonlinear flight controllers. Massively parallel information processing systems for space useage, and a comparative evaluation of RSL/REVS and PSL/PSA applied to a digital flight control system, are some of the topics mentioned. Attention is given to the architecture of both hierarchical multicomputer systems for satellite surveillance and data processing at ESA, and to on-board handling systems for ESA satellites, as well as to aerospace computer software. C.F.W.

A79-54385 # Software engineering and standardization at the European Space Agency - Present practice and trends. C. Mazza (ESA, European Space Operations Centre, Darmstadt, West Germany). In: Computers in Aerospace Conference, 2nd, Los Angeles, Calif., October 22-24, 1979, Technical Papers.
New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 33-38. 12 refs. (AIAA 79-1908)

The paper describes the present trends and practices of the ESA software engineering group, emphasizing the distribution of responsibility and the procurement of software through contracts. Guidelines for these procurements are given and the basic types of contracts, whether software products or services, are examined. The development of a software system is broken down into four phases: conception, definition, development, and operational phases, and two points are stressed for the success of these procurements. Various recommendations for the specifications of bid contents are made as well as those concerning the inclusion of clauses which allow smooth and successful running of the contract. C.F.W.

A79-54388 # **Large scale software design management systems - Application study and implementation for a multi-computer weapon system flight trainer.** B. L. Morgan and R. M. Skirkanich (Grumman Data Systems Corp., Woodbury, N.Y.). In: Computers in Aerospace Conference, 2nd, Los Angeles, Calif., October 22-24, 1979, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 48-54. (AIAA 79-1912)

STAR ENTRIES

N79-10592# Charles River Associates, Inc., Cambridge, Mass.
REGIONAL MANAGEMENT OF AUTOMATIVE EMISSIONS: THE EFFECTIVENESS OF ALTERNATIVE POLICIES FOR LOS ANGELES Final Report
Frederick J. Dunbar Dec. 1977 301 p refs
(Contract EPA-68-01-2235)
(PB-281213/9; EPA-600/5-77-014) Avail: NTIS HC A14/MF A01 CSCL 13B

A relatively quick and reliable method is developed for estimating the cost effectiveness of travel related policies. The methods used include application of a behavorial demand model for automobile travel by mode, purpose and destination, and a model which predicts the size of the auto stock and its age distribution. These models are used to compute the costs to society and individual travelers of various policies, and to compute the emission reduction effects of various policies. In applying these procedures to Los Angeles, the following specific strategies were evaluated: (1) increased gas taxes; (2) taxes on vehicle emissions per mile based on odometer readings and emissions tests; (3) nonresidential parking surcharges; (4) extensions of route miles by conventional bus, and (5) annual taxes based on vehicle model, make and year. GRA

N79-10933# Decisions and Designs, Inc., McLean, Va.
RESEARCH ON THE TECHNOLOGY OF INFERENCE AND DECISION Final Report, 1 Oct. 1976 - 30 Sep. 1977
Ward Edwards, Richard John, and William Stillwell Nov. 1977 45 p refs
(Contract N00014-76-C-0074; ARPA Order 3052)
(AD-A056921) Avail: NTIS HC A03/MF A01 CSCL 05/1

This report summarizes twelve months of research on the technology of inference and decision. Theoretical research and experimental work on three major topics; elicitation of subjective probabilities, multi-attribute utility theory, and the application of decision technology, is discussed. Experimental work showed that simple averaging of individual's probability judgments to form a group judgment did not differ significantly from behavioral interaction in final quality of the judgments as evaluated by a quadratic scoring rule. Other experimental work indicated that elicitation techniques were of significant importance to the quality of judgments. Response scales were found to affect both the magnitude and veridicality of probabilistic judgment. In the assessment of subjective probability distributions elicitation technique was found to interact with the type of distribution used to generate the data in that biases introduced in subjective probability distributions varied as a function of the uncertain quantity being assessed. GRA

N79-10934# National Technical Information Service, Springfield, Va.
MATHEMATICAL MODELS OF MANPOWER AND PERSONNEL MANAGEMENT, VOLUME 2 Progress Report, 1974 - Jun. 1978
Mary E. Young Jul. 1978 276 p Supersedes NTIS/PS-77/0623; NTIS/PS-76/0564; NTIS/PS-75/499
(NTIS/PS-78/0668/0; NTIS/PS-77/0623; NTIS/PS-76/0564; NTIS/PS-75/499) Avail: NTIS HC $28.00/MF $28.00 CSCL 05I

Models of manpower allocation, systems, and requirements, as well as specific task systems, forecasting, and evaluation are included in the cited reports. Both military and civilian requirements are covered. (This updated bibliography contains 270 abstracts, 68 of which are new entries to the previous edition.) GRA

N79-10936# Applied Management Sciences, Inc., Silver Spring, Md.
A STUDY OF LIBRARY COOPERATIVES, NETWORKS AND DEMONSTRATION PROJECTS, VOLUME 1: FINDINGS AND RECOMMENDATIONS Final Report
Ruth Patrick, Joseph Casey, Carol Novalis, and Arthur Kirschenbaum 31 Mar. 1978 477 p refs 2 Vol.
(Contract OE-300-76-0464)
(PB-282526/3; OE/OHD-76/24-1-Vol-1) Avail: NTIS HC A21/MF A01 CSCL 05B

The impacts of the HEA IIb and the LSCA III programs are assessed. Data was obtained at the Federal state and project level by means of mail questionnaire, telephone interviews and on site visits. Program effectiveness was adjudged through services, finances, personnel evaluation, and dissemination of program information. Inquiry was also made relevant to policy and operation. The final results propose restructuring existing federal library legislation to conform to a three stage model, consisting of: innovation knowledge building, testing/capacity building, and program operation. GRA

N79-10937# Applied Management Sciences, Inc., Silver Spring, Md.
A STUDY OF LIBRARY COOPERATIVES, NETWORKS AND DEMONSTRATION PROJECTS, VOLUME 2. CASE STUDY REPORTS: TWELVE PROJECTS SUPPORTED BY THE HEA 2-B LIBRARY RESEARCH AND DEMONSTRATION PROGRAM AND LSCA 3 MULTITYPE LIBRARY COOPERATION AND NETWORKING IN TEN STATES Final Report
Joseph Casey, Carol Novalis, and Ruth Patrick 31 Mar. 1978 442 p 2 Vol.
(Contract OE-300-76-0464)
(PB-282527/1; OE/OHD-76/24-2-Vol-2) Avail: NTIS HC A19/MF A01 CSCL 05B

Results are presented of Applied Management Sciences Study of Library Cooperatives, Networks, and Demonstration Projects. Case studies appropriate to the two Federal programs falling within the scope of the study are described. These are the Library Research and Demonstration Component of Title 2-B of the Higher Education Act, and Title 3 of the Library Services and Construction Actinterlibrary cooperation and networking. Part one presents 12 case studies of HEA II-B Library Research and Demonstration projects, and Part two presents case studies of the operation and impact of LSCA III in 10 states. The case studies provide important insights into operations of the two Programs and have implications for future directions in networking and library research and demonstration at all levels. GRA

N79-10952# National Technical Information Service, Springfield, Va.
TECHNOLOGY ASSESSMENT, VOLUME 3. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, Aug. 1977 - Jun. 1978
Carolyn Shonyo Aug. 1978 208 p Supersedes NTIS/PS-77/0624; NTIS/PS-76/0483; NTIS/PS-75/494
(NTIS/PS-78/0831/4; NTIS/PS-77/0624; NTIS/PS-76/0483; NTIS/PS-75/494) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

The bibliography cites references concerning the assessment of technology in a wide variety of fields from social to the physical sciences. The majority of the references are in the applied physical sciences, including energy. Theoretical and applied studies are covered. GRA

N79-10957# Office of Technology Assessment, Washington, D. C.
APPLICATIONS OF R/D IN THE CIVIL SECTOR: THE OPPORTUNITY PROVIDED BY THE FEDERAL GRANT AND COOPERATIVE AGREEMENT ACT OF 1977
Jun. 1978 47 p refs
(PB-283035/4; OTA-R-65) Avail: NTIS HC A03/MF A01 CSCL 05A

The framework established by the act has important implications for Federally funded R&D and for the Federal impact on innovation involving private industry, the universities and nonprofit organizations, and State and local governments. Discussed in this volume are assistance and procurement relationships, the relationship of Federal and non-Federal R&D agencies and agreements, and related implications for Congressional oversight. GRA

N79-10962# Mitre Corp., McLean, Va.
REVIEW OF DOWNTOWN PEOPLE MOVER PROPOSALS: PRELIMINARY MARKET IMPLICATIONS FOR DOWNTOWN APPLICATIONS OF AUTOMATED GUIDEWAY TRANSIT
Nancy B. Mabee and Barbara A. Zumwalt Dec. 1977 144 p refs
(Contract DOT-UT-50016)
(PB-281068/7; MTR-7691; UMTA-IT-06-0176-77-1) Avail: NTIS HC A07/MF A01 CSCL 13B

The potential market for automated guideway transit (AGT) systems in the United States was ascertained from 38 proposals submitted for consideration in UMTA's downtown people mover (DPM) project. These proposals address a range of socioeconomic considerations related to the installation of DPM systems in central business districts. The considerations include application site characteristics, system ridership, system economics, past project planning, local funding sources, related transportation planning activities, related central city redevelopment activities, and environmental impacts. The status of AGT technology in the U.S. is discussed. A summary of the project and site characteristics given in the DPM proposals, and individual summary sheets for each city are included. GRA

N79-10963# Transportation Research Board, Washington, D. C.
PLANNING AND DESIGN OF RAPID TRANSIT FACILITIES
1978 56 p refs
(PB-282600/6; TRB/TRR-662; ISBN-0-309-02691-1) Avail: NTIS HC A04/MF A01 CSCL 13B

The 9 papers in this report deal with the following areas: energy efficient rail transit operation; passenger utilization of local vs express trains for a New York City subway line: a case study; some aesthetic considerations in light rail design; a study of passenger transfer facilities (abridgment); a transit station design process (abridgment); peak-off peak revenue and cost allocation model; contract management in the transit industry; toward the development of an accommodation service policy; and future ridership on New York City's rapid transit system (abridgment). GRA

N79-10997*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TECHNOLOGICAL CHANGE AND PRODUCTIVITY GROWTH IN THE AIR TRANSPORT INDUSTRY
Nathan Rosenberg (Stanford Univ., Calif.), Alexander Thompson (Stanford Univ., Calif.), and Steven E. Belsley Sep. 1978 101 p refs
(NASA-TM-78505; A-7514) Avail: NTIS HC A06/MF A01 CSCL 02A

The progress of the civil air transport industry in the United States was examined in the light of a proposal of Enos who, after examining the growth of the petroleum industry, divided that phenomenon into two phases, the alpha and the beta; that is, the invention, first development and production, and the improvement phase. The civil air transport industry developed along similar lines with the technological progress coming in waves; each wave encompassing several new technological advances while retaining the best of the old ones. At the same time the productivity of the transport aircraft as expressed by the product of the aircraft velocity and the passenger capacity increased sufficiently to allow the direct operating cost in cents per passenger mile to continually decrease with each successive aircraft development. L.S.

N79-11250# Army Industrial Base Engineering Activity, Rock Island, Ill.
MANUFACTURING METHODS AND TECHNOLOGY PROJECT SUMMARY REPORTS Final Report
Jun. 1978 65 p
(AD-A057361) Avail: NTIS HC A04/MF A01 CSCL 05/1

The Project Summary Report is a compilation of MM and T summary reports prepared by IBEA based on information submitted by DARCOM Major Subordinate Commands and Project Managers. These projects represent the types of efforts that are being conducted under the Army's MM and T Program. Author (GRA)

N79-11344# National Bureau of Standards, Washington, D. C. National Engineering Lab.
GOVERNMENT PROGRAMS ON ADVANCED TECHNOLOGY AND MANUFACTURING TECHNIQUES: COMMENTS ON USA, JAPAN, AND EUROPE
W. Murray Bullis Jun. 1978 17 p refs
(PB-283223/6; NBSIR-78-1482) Avail: NTIS HC A02/MF A01 CSCL 09A

International challenges are being viewed by many in industry as requiring responsive efforts by the Federal Government. One such response could be in the form of technological cooperation between government and industry in areas where the industry may desire assistance in solving generic design, manufacturing, or testing problems. The Department of Commerce is considering new mechanisms for carrying out such cooperative efforts. These mechanisms are described following a brief review of other past and present government programs in advanced technology and manufacturing techniques, both here and abroad. GRA

N79-11936# Decisions and Designs, Inc., McLean, Va.
RESEARCH PROJECT ON DECISION-ANALYTIC TECHNOLOGY Final Report
Rex V. Brown May 1978 35 p refs
(Contract N00014-75-C-0426)
(AD-A056252; PR-78-11-25) Avail: NTIS HC A03/MF A01 CSCL 05/10

This report describes a research effort extending over two and a half years. Its primary objective was to develop the technology in which decisions and inferences are made by individuals and implemented on a computer. The conceptual framework within which the decision aids are developed is personalist decision theory including Bayesian Inference. Tasks were undertaken in five general areas: method generalization; development of specific techniques; development of basic theory; behavioral research; and illustrative case studies. They resulted in 18 technical reports, 10 working papers, and 7 archival publications. Titles and abstracts of working papers are given in the appendix. GRA

N79-11937# Rice Univ., Houston, Tex. Dept. of Electrical Engineering.
COMPUTATIONALLY EFFICIENT ESTIMATORS FOR THE BAYES RISK
Lynn D. Wilcox and Rui J. P. Figueiredo May 1978 114 p refs
(Grant AF-AFOSR-2777-75)
(AD-A055997; EE-TR-7804) Avail: NTIS HC A06/MF A01 CSCL 05/8

A computationally efficient estimator for the Bayes risk is one which achieves a desired accuracy with a minimum of computation. In many problems, for example speech recognition, point evaluations of the class conditional densities are computationally costly. Density evaluations are the single most important factor contributing to the computational effort in Bayes risk estimation, thus the amount of computation required by a Bayes risk estimator is defined as the average number of conditional density evaluations it performs. The accuracy of risk estimator is defined by its variance. In practice, the true optimal estimator cannot be determined since this would in effect require knowledge of the true risk R. Thus a technique

whereby the first n of the total N samples are used to approximate the optimal estimator is proposed. The n samples should contain enough information on the closeness of the classes to determine an almost optimal estimator. The last N-n samples are used in the approximate optimal estimator to obtain an accurate estimate of the risk with a minimum of computation. GRA

N79-11938# Iowa Univ., Iowa City. Testing Programs.
A NOTE RELATING TWO DECISION SYSTEMS Technical Report, Oct. 1977 - May 1978
Charles Lewis (Illinois Univ. at Urbana-Champaign) and Melvin R. Novick 1 Jun. 1978 19 p refs
(Contract N00014-77-C-0428; RR0420401)
(AD-A057698; TR-78-2) Avail: NTIS HC A02/MF A01 CSCL 12/1

Specifically, problability, utility, and the expression of preference in terms of conditional expected utility were all developed from a set of non-numerical axioms about preference ordering. It is the purpose of this note to investigate the connections among several systems. GRA

N79-11941# European Space Agency, Paris (France).
[ACTIVITIES OF THE EUROPEAN SPACE AGENCY] Annual Report, 1977
1978 221 p refs
Avail: NTIS HC A10/MF A01

The European Space Agency's scientific and communication satellite, earth observation, Spacelab, and Ariane launcher program activities in 1977 are reviewed. Future programs, technological and scientific research, satellite operations and data processing, and the Space Documentation Service are discussed. ESA facilities, notably ground facilities for space systems and technical facilities, are reported and the organization and structure, external relations, and finance of ESA are dealt with. In 1977 the GEOS, OTS, ISEE-B, and Meteosat satellites were launched. The GEOS and OTS launched failed because of problems with the Thor Delta launchers. ESA

N79-11943# General Accounting Office, Washington, D. C. Community and Economic Development Div.
NEED FOR IMPROVING MANAGEMENT OF US OCEANOGRAPHIC ASSETS
16 Jun. 1978 33 p refs
(PB-283105/5; CED-78-125) Avail: NTIS HC A03/MF A01 CSCL 05A

GAO reviewed the Nation's ocean research/survey fleet and compiled information on its cost and operations. The United States has no comprehensive national ocean program or plan. Federal oceanic activities are conducted by 21 organizations in 6 departments and 5 agencies. As a result, oceanographic vessels operated to support these activities are funded, operated, and managed independently of one another. No single agency is responsible for the overall coordination or management of the fleet or its operations. GRA

N79-11944# National Technical Information Service, Springfield, Va.
INVENTORY CONTROL, VOLUME 1. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1970 - 1976
Edith Kenton Aug. 1978 293 p
(NTIS/PS-78/0914/8) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

Research on theoretical and practical inventory problems in military and commercial activities is cited. Studies are included on automated inventory systems, mathematical programming to forecast replacement and reorder times, and mathematical modeling of multiechelon inventory systems. This updated bibliography contains 287 abstracts, none of which are new entries to the previous edition. GRA

N79-11945# National Technical Information Service, Springfield, Va.
INVENTORY CONTROL, VOLUME 2. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1977 - Aug. 1978
Edith Kenton Aug. 1978 107 p Supersedes NTIS/PS-77/0778; NTIS/PS-76/0716; NTIS/PS-75/631; NTIS/PS-74/121 (NTIS/PS-78/0915/5; NTIS/PS-77/0778; NTIS/PS-76/0716; NTIS/PS-75/631; NTIS/PS-74/121) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

Research on theoretical and practical inventory problems in military and commercial activities is cited. Studies are included on automated inventory systems, mathematical programming to forecast replacement and reorder times, and mathematical modeling of multiechelon inventory systems. This updated bibliography contains 102 abstracts, 65 of which are new entries to the previous edition. GRA

N79-11960# National Technical Information Service, Springfield, Va.
WATER POLLUTION ECONOMICS, VOLUME 3. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, Sep. 1977 - Aug. 1978
Diane M. Cavagnaro Sep. 1978 133 p Supersedes NTIS/PS-77/0784; NTIS/PS-76/0666; NTIS/PS-75/537; NTIS/PS-74/094
(NTIS/PS-78/0927/0; NTIS/PS-77/0784; NTIS/PS-76/0666; NTIS/PS-75/537; NTIS/PS-74/094) Avail: NTIS HC $28.00/MF $28.00 CSCL 13B

This bibliography cites aspects of the economics of water pollution control and management. The citations cover the economics involved with industrial clean up, government planning, resource management, and urban planning. Economic impacts of pollution and its control on specific industries, regions, or the economy as a whole are included. This updated bibliography contains 126 abstracts, all of which are new entries to the previous edition. GRA

N79-11961# National Technical Information Service, Springfield, Va.
WATER POLLUTION ECONOMICS, VOLUME 2. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1975 - Aug. 1977
Diane M. Cavagnaro Sep. 1978 190 p
(NTIS/PS-78/0926/2) Avail: NTIS HC $28.00/MF $28.00 CSCL 13B

The economics of water pollution control and management, covering the economics involved with industrial clean up, government planning, resource management, and urban planning are reported. The economic impacts of pollution and its control on specific industries, regions, or the economy as a whole are included. This updated bibliography contains 183 abstracts, none of which are new entries to the previous edition. GRA

N79-12049# Federal Aviation Administration, Washington, D. C.
ENGINEERING AND DEVELOPMENT PROGRAM PLAN: AIRCRAFT SAFETY
Jun. 1978 40 p
(AD-A058546; FAA-ED-18-1A) Avail: NTIS HC A03/MF A01 CSCL 01/3

The Aircraft Safety Program Engineering and Development Plan describes the objectives, the scope of work and the funding requirements to meet the Federal Aviation Administration's research need in aircraft safety for the 1978-85 period. The plan covers work in fire safety, transport safety, and general aviation aircraft safety. Author

N79-12316# Computer Sciences Corp., Falls Church, Va.
MARITIME SATELLITE COMMUNICATIONS: A MANAGEMENT PERSPECTIVE Final Report, Feb. 1976 - Apr. 1978
William H. Penrose Apr. 1978 70 p refs
(PB-283698/9; MA-RD-930-78060) Avail: NTIS HC A04/MF A01 CSCL 17B

The results are summarized of a study of the long-run costs and benefits of maritime satellite communications. The study reviews the efforts of participating U.S. flag shipping companies in using this new technology to solve some pressing problems of fleet management. Certain technical operating and economic aspects of maritime satellite and HF (sitor/selcall) radio com-

munications are also discussed to assist ship operators in obtaining the information needed to develop a management perspective for corporate decision making in reference to these new communications services. GRA

N79-12946# National Technical Information Service, Springfield, Va.
MANAGEMENT BY OBJECTIVES. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Aug. 1978
Mary E. Young Sep. 1978 72 p Supersedes NTIS/PS-77/0892
(NTIS/PS-78/0976/7; NTIS/PS-77/0892) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

The bibliography cites studies relating to the philosophy of MBO (Management by Objectives), as well as positive and negative factors where MBO has been implemented. Case studies of implementation include health care planning, urban planning, local governments, housing, military management, R & D organizations, etc. GRA

N79-12947# Advisory Group for Aerospace Research and Development, Paris (France).
SUGGESTED DATA ELEMENTS FOR RECORDING ON-GOING RESEARCH AND DEVELOPMENT EFFORTS: A MANAGEMENT INFORMATION SYSTEM
H. E. Sauter (DDC, Alexandria, Va.) Oct. 1978 11 p refs
(AGARD-R-669; ISBN-92-835-1298-7) Avail: NTIS HC A02/MF A01

Data elements integral to a Research and Development Management Information System are gathered from a sampling of operating systems, listed, and defined. A work unit level of reporting is defined, and its advantages are given. Working groups are established to develop a standardization of data elements. S.E.S.

N79-12955# SRI International Corp., Menlo Park, Calif. Naval Warfare Research Center.
AUTOMATED DATA SYSTEMS (ADS) MANAGEMENT METHODOLOGY. VOLUME 2: AUTOMATED DATA SYSTEMS PROJECT EVALUATION METHODOLOGY Final Report
David L. Harvey, Terrance M. Keen, Edward H. Means, William Schubert, and Graham F. Wallace Dec. 1977 46 p refs 2 Vol.
(Contract N00014-76-C-1119; SRI Proj. 5765-4)
(AD-A057915) Avail: NTIS HC A03/MF A01 CSCL 09/2

This document synthesizes and compiles the results obtained under the study tasks. GRA

N79-12956# SRI International Corp., Menlo Park, Calif. Naval Research Center.
AUTOMATED DATA SYSTEMS (ADS) MANAGEMENT METHODOLOGY. VOLUME 1: AUTOMATED DATA SYSTEMS CONCEPT PHASE DOCUMENT PREPARATION METHODOLOGY Final Report
David L. Harvey, Terrance M. Keen, Edward H. Means, William Hubert, and Graham F. Wallace Dec. 1977 132 p 2 Vol.
(Contract N00014-76-C-1119; SRI Proj. 5765-4)
(AD-A057914) Avail: NTIS HC A07/MF A01 CSCL 09/2

The specific objectives of the research were as follows: Operationally define the management and analysis tasks and duties that must be performed in the preparation of an ADS Development Plan; Operationally define a procedural methodology for developing ADS objectives and associated measures of objective fulfillment; Develop specific methodologies needed to guide developers and decision makers for ADS systems so that the anticipated value of the proposed system can be assured and its total cost impact estimated and controlled; and Assist HQMC to translate the study results into procedures and policies. GRA

N79-12960# New York Univ., N. Y.
RESEARCH MANAGEMENT AND COMPUTER USE Final Report
Eleazer Bromberg 1978 177 p
(Grant NSF RMI-74-12767)
(PB-283648/4) Avail: NTIS HC A09/MF A01 CSCL 05A

Three systems developed to meet research management needs at NYU are discussed. The Faculty Research Interest Inventory is a computerized system for matching research interests to faculty members' names. The Computerized Checkbook simplifies planning and bookkeeping for both project directors and central fiscal offices. The Cost Analysis of Organized Research program provides a reasonable quantitative estimate of the costs of the various components of the university research enterprise. The methodology for each of these systems is described. GRA

N79-12970*# Gnostic Concepts, Inc., Menlo Park, Calif.
INDUSTRIALIZATION STUDY Final Report
28 Aug. 1978 194 p
(Contracts NAS7-100; JPL-954899)
(NASA-CR-157953; DOE/JPL-954899-78/3) Avail: NTIS HC A09/MF A01 CSCL 05A

The investment process in U.S. industries was studied in order to characterize the critical elements in major high risk investment decisions. Because motivation was determined to be the greatest single factor force in inducing a company to invest in a high risk venture, the relative impact of alternative government programs and policies on personal and financial motivations were analyzed qualitatively and quantitatively to ascertain the effect on these programs and policies on photovoltaic industrialization. The government alternatives are ranked on the basis of their ease of implementation and their probable effect. The recommended sequence in which government policies would be applied to maximize the industrialization of the photovoltaic venture is discussed. A.R.H.

N79-13209# National Bureau of Standards, Washington, D. C. Center for Building Technology.
METRICATION IN BUILDING DESIGN, PRODUCTION, AND CONSTRUCTION: A COMPENDIUM OF 10 PAPERS Final Report
Hans J. Milton Sep. 1978 199 p
(PB-285534/4; NBS-SP-530; LC-78-600086) Avail: NTIS HC A09/MF A01 CSCL 13M

Some of the subject areas addressed are: management and economics of metrication; specific product metrication; public construction sector role in metrication; building standards and codes in metrication; graphic design in metrication; and United States' opportunities in metrication. A subject index has been included for ready reference to specific metric topics. GRA

N79-13531# Institute for Energy Analysis, Oak Ridge, Tenn.
THREE MODES OF ENERGY COST ANALYSIS: THEN-CURRENT DOLLARS, BASE-YEAR DOLLARS, AND PERPETUAL-CONSTANT DOLLARS
R. M. Harnett and D. L. Phung Jun. 1978 22 p refs
(Contract EY-76-C-05-0033)
(ORAU/IEA-78-10(M)) Avail: NTIS HC A02/MF A01

The cost analysis of energy supplied by a facility over its life cycle is complicated by inflation and by discount rates. Neglect of inflation and improper use of discount rates have often rendered elaborate cost calculations meaningless and have added to the great confusion as to the merits of competing technologies. It is shown in this paper that three modes of energy-cost calculations can be clearly distinguished by the manner in which inflation is treated. Each mode has a well-defined discount rate and is used in conjunction with a well-defined set of input data. A numerical example is provided for the cost comparison of several alternatives for supplying synthetic fuels. DOE

N79-13534# Environmental Law Inst., Washington, D. C.
LEGAL BARRIERS TO SOLAR HEATING AND COOLING OF BUILDINGS
Mar. 1978 231 p refs
(Contract EX-76-C-01-2528)
(HCP/M2528-1) Avail: NTIS HC A11/MF A01

A study of the legal problems that may be encountered by commercial, industrial, and individual users of solar energy for heating and cooling is presented. The study consists primarily of a review of existing literature, and extensive lists of references are included. Topics by section include: (1) solar access and land use issues, (2) building codes, (3) home financing, (4) utilities, (5) mandatory installation, (6) ERDA patent policy, (7) antitrust and fostering competition, (8) labor union resistance and conflicts, (9) property taxes, (10) mobile homes, and (11) tort liability, insurance, and warranties. Author (DOE)

N79-13539# Battelle Pacific Northwest Labs., Richland, Wash.
ANALYSIS OF FEDERAL INCENTIVES USED TO STIMULATE ENERGY PRODUCTION
Jun. 1978 400 p refs
(Contract EY-76-C-06-1830)
(PNL-2410) Avail: NTIS HC A17/MF A01

A Federal incentive is any action that can be taken by the government to expand residential and commercial use of solar energy. The text of this report identifies, qualifies, and analyzes such incentives and relates them to current thought about solar energy. Four viewpoints used in this discussion come from four types of analysis: economic, political, organizational and legal. Actions (primarily domestic) that the Federal government has taken are identified. Incentives, investments, liabilities, regulations, and other factors are analyzed in detail for nuclear energy, hydroelectric power, coal, petroleum, and natural gas. Incentives of all energy sources are discussed with respect to solar energy policy. Author (DOE)

N79-13751# TRW Defense and Space Systems Group, Redondo Beach, Calif.
AIRBORNE SYSTEMS SOFTWARE ACQUISITION ENGINEERING GUIDEBOOK FOR QUALITY ASSURANCE Final Report
M. Lipow Nov. 1977 112 p refs
(Contract F33657-76-C-0677; AF Proj. 2238)
(AD-A059068; TRW-30323-6005-TU-00; ASD-TR-78-8) Avail: NTIS HC A06/MF A01 CSCL 09/2

This report is one of a series of guidebooks which provide guidance for ASD and SAMSO Program Office and engineering personnel in the acquisition management and engineering of Airborne Systems software procured under Air Force 800 series regulations. It provides information that will help personnel plan, specify, and monitor quality assurance activities in connection with the acquisition of Computer Program Configuration Items (CPCIs) for Airborne Systems. Author (GRA)

N79-13906* National Aeronautics and Space Administration, Washington, D. C.
HIGHLIGHTS OF 1978 ACTIVITIES
26 Dec. 1978 18 p
(NASA-News-Release-78-190; P78-10196) Avail: NASA Scientific and Technical Information Facility, P.O. Box 8757, B.W.I. Airport, Md. 21240 CSCL 05A

General highlights of NASA's activities for 1978 are presented. The highlights are categorized into topics such as space science, space transportation systems, space and terrestrial applications, environment, technology utilization, aeronautics, space research and technology, energy programs, and international. A list of the 1978 launches including: (1) launch date; (2) payload designation; (3) launch vehicle; (4) launch site and (5) mission remarks is also presented. G.Y.

N79-13907# Michigan Univ., Ann Arbor. Inst. for Social Research.
FUTURE PERFORMANCE TREND INDICATORS: A CURRENT VALUE APPROACH TO HUMAN RESOURCES ACCOUNTING. REPORT 6: UTILIZATION PROBLEMS TIED TO METHODOLOGICAL ISSUES
David G. Bowers and Alan S. Davenport Aug. 1978 57 p refs
(Contract N00014-76-C-0362)
(AD-A058831; Rept-6) Avail: NTIS HC A04/MF A01 CSCL 05/9

This report discusses theoretical issues and methodological concerns relating to the implementation of a Current Value Approach to Human Resource Accounting. The topics presented include: reliability, validity of predictors and criterion, limits on variance available for predictions, transformation of data, non-dollar metrics, unit of analysis and subsetting of organizational members, consistency of predictor-criterion relationships across time and function, multicolinearity, number of predictor variables, and patterns of change. Suggestions for solutions to implementation problems are given, as are recommendations for additional areas of investigation into theoretical and utilization issues. Author (GRA)

N79-13908# Air Force Human Resources Lab., Brooks AFB, Tex.
HIER-GRP: A COMPUTER PROGRAM FOR THE HIERARCHICAL GROUPING OF REGRESSION EQUATIONS Final Report
C. Deene Gott Jun. 1978 70 p refs
(AF Proj. 6323)
(AD-A058415; AFHRL-TR-78-14) Avail: NTIS HC A04/MF A01 CSCL 05/1

This report describes the technical details required for using the HIER-GRP computer program as it is currently operational on the Univac 1108. HIER-GRP (or one of the earlier versions of the program) has been used in the past, especially in conjunction with 'policy-capturing applications,' and many of those applications are referenced herein. The report contains a discussion of the basic algorithm, an outline of the essential steps, specifications of the computer system requirements, descriptions of necessary control cards, and explanations of the program output. Also, appendices are included that contain the mathematical formulas used, some mathematical background helpful for understanding the algorithm, sample output, and a complete source card listing. GRA

N79-13909# Decisions and Designs, Inc., McLean, Va.
ADVANCED DECISION TECHNOLOGY PROGRAM Annual Progress Report, 1 Oct. 1976 - 30 Sep. 1977
30 Dec. 1977 60 p refs Prepared in cooperation with Perceptronics, Inc., Woodland Hills, Calif.; Harvard Univ., Cambridge, Mass.; Stanford Univ. and Univ. of Southern Calif., University Park
(Contract N00014-76-C-0074)
(AD-A058478; PR-77-12-30) Avail: NTIS HC A04/MF A01 CSCL 05/1

This report presents a review of salient progress and accomplishments achieved in the ARPA-supported Advanced Decision Technology Program during Fiscal Year 1977. The research highlighted is concerned with a variety of technical questions fundamental to the development and refinement of utilitarian decision aids. Applied research activities conducted under the research program concerned with the application of the variety of decision aiding concepts to DOD decision problems are also reviewed. Author (GRA)

N79-13910# National Technical Information Service, Springfield, Va.
MANAGEMENT INFORMATION SYSTEMS, VOLUME 1: A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Oct. 1977
Carolyn Shonyo Oct. 1978 294 p
(NTIS/PS-78/1068/2) Avail: NTIS HC $28.00/MF $28.00 CSCL 05B

Although many applications of management information systems are discussed, the bulk of the research has major applications to Medicaid, health care, medical information systems, and logistics management. Research on information systems used in decision making is included. This updated bibliography contains 289 abstracts, none of which are new entries to the previous edition. GRA

N79-13911# National Technical Information Service, Springfield, Va.
MANAGEMENT INFORMATION SYSTEMS, VOLUME 2. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, Nov. 1977 - Sep. 1978
Carolyn Shonyo Oct. 1978 84 p Supersedes NTIS/PS-77/0918; NTIS/PS-76/0779; NTIS/PS-75/601
(NTIS/PS-78/1069/0; NTIS/PS-77/0918; NTIS/PS-76/0779; NTIS/PS-75/601) Avail: NTIS HC $28.00/MF $28.00 CSCL 05B

Although many applications of management information systems are discussed, the bulk of the research has major applications to Medicaid, health care, medical information systems, and logistic management. Research on information systems used in decision making is included. This updated bibliography contains 79 abstracts, all of which are new entries to the previous edition. GRA

N79-13912# CONSAD Research Corp., Pittsburgh, Pa.
DESIGN AND PILOT TESTING OF A UTILIZATION TRACKING METHODOLOGY Final Report
31 Jan. 1978 291 p refs
(Contract NSF C-76-11438)
(PB-284640/0; NSF/RA-780057) Avail: NTIS HC A13/MF A01 CSCL 05A

A data acquisition system, the utilization tracking system, was developed and pilot tested to facilitate the development of an acceptable long-range utilization assessment program. The fully operational system of this type would maintain: (1)continuing, repeated surveys of principal investigators and program managers; (2)continuing repeated surveys of designated users of projects research results;(3) snowball expansion of the samples of prospective users; and (4) development of analytic techniques to exploit the information obtained in these surveys. In addition to serving the important immediate purpose of providing the basis for the estimation of current levels of utilization of individual research projects, the preceeding data acquisition capabilities will facilitate an enhanced understanding of the dynamics of the diffusion, adoption, and utilization of the product of projects funded by NSF/RANN. GRA

N79-13913# National Academy of Sciences - National Research Council, Washington, D. C. Ad Hoc Steering Committee for the Study of Research Applied to National Needs.
STRATEGIES FOR APPLIED RESEARCH MANAGEMENT
1978 124 p refs
(Contract NSF C-310)
(PB-284741/6; NSF/RA-780088) Avail: NTIS HC A06/MF A01 CSCL 05A

A product of interviews, deliberations, reviews, and a workshop--all dedicated to the identification of alternate, workable management strategies for the effective use of RANN research results is reported. The study was conducted through interviews and discussions with the respective division directors, personnel of other agencies, representatives of participating governmental units, universities and/or industrial firms, and even with representatives of withdrawn unsuccessful bidders. The four case study areas were: the delivery of public services to remote areas via telecommunications technology; the solar heating and cooling of buildings; trace contaminants in the environment from agricultural, mining, and manufacturing activities; and industrial productivity (automation). GRA

N79-13920# National Technical Information Service, Springfield, Va.
URBAN INFORMATION SYSTEMS. PART 1: GENERAL, VOLUME 1. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - 1976
Mary E. Young Sep. 1978 174 p
(NTIS/PS-78/1027/8) Avail: NTIS HC $28.00/MF $28.00 CSCL 05B

Research is cited on urban management and municipal information systems. Part 1 includes reports not sponsored by USAC (Urban Information Systems Interagency Committee). The reports are intended for use by urban administrators and planners at all levels of management. GRA

N79-13921# National Technical Information Service, Springfield, Va.
URBAN INFORMATION SYSTEMS. PART 1: GENERAL, VOLUME 2. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1977 - Sep. 1978
Mary E. Young Sep. 1978 121 p Supersedes NTIS/PS-77/0936; NTIS/PS-76/0720; NTIS/PS-75/623
(NTIS/PS-78/1028/6; NTIS/PS-77/0936; NTIS/PS-76/0720; NTIS/PS-75/623) Avail: NTIS HC $28.00/MF $28.00 CSCL 05B

Research is cited on urban management and municipal information systems. Part 1 includes reports not sponsored by USAC (Urban Information Systems Interagency Committee). The reports are intended for use by urban administrators and planners at all levels of management. GRA

N79-13922# National Technical Information Service, Springfield, Va.
URBAN INFORMATION SYSTEMS. PART 2: USAC REPORTS. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Sep. 1978
Mary E. Young Sep. 1978 367 p Supersedes NTIS/PS-77/0937; NTIS/PS-76/0721; NTIS/PS-75/624
(NTIS/PS-78/1029/4; NTIS/PS-77/0937) Avail: NTIS HC $28.00/MF $28.00 CSCL 05B

Research on urban management and municipal information systems is presented. Part 2 consists of reports sponsored by USAC (Urban Information Systems Interagency Committee), organized by participating cities. These reports are on systems designed as models for future planning and use by all municipalities. GRA

N79-13932# Committee on Commerce, Science, and Transportation (U. S. Senate).
NATIONAL AERONAUTICS AND SPACE ACT OF 1958, AS AMENDED, AND RELATED LEGISLATION
Washington GPO 1978 190 p Rept. for Comm. on Commerce, Sci., and Transportation, 95th Congr., 2d Sess., Dec. 1978
(GPO-34-175) Avail: Comm. on Commerce, Sci., and Transportation

A compilation of the texts of the public laws that relate to aeronautical and space research and development activities is presented. Emphasis is placed on how these activities relate to the functions and responsibilities of the National Aeronautics and Space Administration. J.M.S.

N79-13933# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1980, PROGRAM REVIEW, VOLUME 1, PART 1
Washington GPO 1978 529 p refs Hearings before the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 95th Congr., 2d Sess., No. 100, 25-27 Sep. 1978
(GPO-35-914) Avail: Subcomm. on Space Sci. and Applications

Current problems of cost, performance, or schedule which affect the NASA budget and program performance are considered with emphasis on the space transportation system and the space tracking and data systems. J.M.S.

N79-13943# Research Group International, Charlottesville, Va.
DEVELOPMENT PLANS AND TECHNOLOGY TRANSFER Final Report
William F. Beazer Jan. 1978 110 p
(PB-284958/6; NSF/PRA-77-SP-0857/1/8) Avail: NTIS HC A06/MF A01 CSCL 05C

Past economic development plans of a sample of five countries were examined to determine goals and targets set out in these plans. The extent to which these targets were achieved are analyzed using past economic and social data. Present development plans are reviewed to determine which specific objectives each nation hopes to accomplish, including industries each nation

hopes to establish and/or expand within each sector (agriculture, manufacturing, mining, services). A framework for the assessment of technology needs and imports for developing countries is provided. GRA

N79-14006# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A COMPUTERIZED METHODOLOGY FOR THE IDENTIFICATION OF AIRCRAFT EQUIPMENT ITEMS FOR RELIABILITY IMPROVEMENT M.S. Thesis
Roosevelt Baker, Jr. and Daniel J. Hollingsworth Jun. 1978 108 p refs
(AD-A059566; AFIT-LSSR-31-78A) Avail: NTIS HC A06/MF A01 CSCL 01/5

The purpose of this research was to develop a model which will identify aircraft equipment items for potential reliability improvement. A model was constructed to utilize a recently compiled data base comprised of four Air Force data collection systems (G033B, D056, D041, and K051). Included in the data base are 31 active Air Force aircraft weapon systems. The model analyzes the data under three replacement policies: (1) Replace on depot condemnation, (2) Replace or repair at the base, and (3) Replace on failure. Given the estimated investment required to improve the reliability of an item, the model will estimate the benefits that would accrue in terms of reduced support cost and increased availability. The investment and benefits are used to form an estimated return-on-investment ratio. The model was exercised on the 1650 stock class of items for the 31 mission design series aircraft. The results of the model, in terms of potential candidates for reliability improvement, were discussed with personnel assigned at the Oklahoma City Air Logistics Center. Author (GRA)

N79-14048*# Douglas Aircraft Co., Inc., Long Beach, Calif.
CARGO LOGISTICS AIRLIFT SYSTEMS STUDY (CLASS). VOLUME 1: ANALYSIS OF CURRENT AIR CARGO SYSTEM
R. J. Burby and W. H. Kuhlman Oct. 1978 580 p refs
(Contract NAS1-14948)
(NASA-CR-158912) Avail: NTIS HC A25/MF A01 CSCL 01C

The material presented in this volume is classified into the following sections; (1) analysis of current routes; (2) air eligibility criteria; (3) current direct support infrastructure; (4) comparative mode analysis; (5) political and economic factors; and (6) future potential market areas. An effort was made to keep the observations and findings relating to the current systems as objective as possible in order not to bias the analysis of future air cargo operations reported in Volume 3 of the CLASS final report. G.Y.

N79-14049*# Douglas Aircraft Co., Inc., Long Beach, Calif.
CARGO LOGISTICS AIRLIFT SYSTEMS STUDY (CLASS). VOLUME 3: CROSS IMPACT BETWEEN THE 1990 MARKET AND THE AIR PHYSICAL DISTRIBUTION SYSTEMS, BOOK 2
R. J. Burby and W. H. Kuhlman Oct. 1978 346 p refs
(Contract NAS1-14948)
(NASA-CR-158914) Avail: NTIS HC A15/MF A01 CSCL 01C

Book 2 of this volume is divided into the following sections: (1) commodities and system networks; (2) future mode choice decisions and commodity air eligibility; (3) comparative cargo transportation costs - air, truck, rail and water; (4) elasticities of demanp; (5) operating cost; (6) operating profit, rate making, and returns; (7) importance of rate and service on future aircraft; (8) potential market demand for new aircraft; (9) scenario of events affecting system/market growth; and (10) future study and technology requirements. G.Y.

N79-14076# Arinc Research Corp., Annapolis, Md.
RELIABILITY IMPROVEMENT WARRANTY (RIW) SUPPORT FOR THE LIGHTWEIGHT DOPPLER NAVIGATION SYSTEM (LDNS) PROGRAM Final Report, Sep. 1977 - Sep. 1978
A. Bilodeau and P. Dallosta Sep. 1978 16 p
(Contract F04606-76-A-0087)
(AD-A059970; Rept-1956-01-1-1804) Avail: NTIS HC A02/MF A01 CSCL 17/7

The Lightweight Doppler Navigation System (LDNS) Program is under the management of the U.S. Army Navigation/Control (NAVCON) Systems Project Office at Fort Monmouth, New Jersey. In December 1976, Singer Company-Kearfott Division was awarded the initial production contract that included the Reliability Improvement Warranty (RIW) terms and provisions. Prior to this contract effort, ARINC Research Corporation assisted the NAVCON Project Office during the Engineering Development (ED) phase of the LDNS Program and participated in the development of RIW terms and conditions of the Initial Production (IP) solicitation. Under the current contract effort, ARINC Research provided engineering assistance in defining the Defense Contract Administration Services Office (DCASO) and the manufacturer's warranty responsibilities, in reviewing the contractor warranty data collection plan, and in developing LDNS field implementation plans. This report presents the results of these activities. Author (GRA)

N79-14257# Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON USSR SCIENCE AND TECHNOLOGY: PHYSICAL SCIENCES AND TECHNOLOGY, NO. 55
1 Dec. 1978 68 p refs Transl. into ENGLISH from various Russian journals
(JPRS-72351) Copyright. Avail: NTIS HC A04/MF A01

The document is divided into three categories: (1) cybernetics, computers and automation technology; (2) engineering and equipment; and (3) physics. In the first category papers are presented on: machine tool digital control program preparation; automated control system development; description of data transmission system; problems of efficiency; and American analogs to Soviet integrated circuits. In the second category reports are given on: the possibility of a logical control law for an optomechanical scanner; statistical analysis of photoelectric multipliers; and a method of error correction in integrating digital measuring devices. The third category describes; a helium-neon laser; plasma cutting and welding; a laser microscope; and Raman spectroscopy.

N79-14258# Joint Publications Research Service, Arlington, Va.
MACHINE TOOL DIGITAL CONTROL PROGRAM PREPARATION AT MINSK CENTER
M. Zhadovich *In its* Transl. on USSR Sci. and Technol.: Phys. Sci. and Technol., No. 55 (JPRS-72351) 1 Dec. 1978 p 1-5 Transl. into ENGLISH from Prom. Belorussii (Minsk), no. 8, 1978 p 60-62
Copyright. Avail: NTIS HC A04/MF A01

An efficient way to automate series production today is to introduce machine tools and other equipment with digital program control (DPC). They expressly insure a notable increase in labor productivity, reduce the time for assimilation of new products, raise the culture of production, and create the prerequisites for full automation of industrial processes using computer technology. Widespread introduction of DPC equipment also frees a considerable number of production workers which is exceptionally important today. That is why the Tenth Five-Year Plan calls for increasing the output of DPC machine tools by not less than a factor of 2.2 while simultaneously expanding the types and making further improvements in their design. The organizational, economical and component factors which will aid in the preparation of this program are discussed. G.Y.

N79-14259# Joint Publications Research Service, Arlington, Va.
AUTOMATED CONTROL SYSTEM DEVELOPMENT
Robert Sergeyevich Sedegov *In its* Transl. on USSR Sci. and Technol.: Phys. Sci. and Technol., No. 55 (JPRS-72351) 1 Dec. 1978 p 6-13 Transl. into ENGLISH from Prom. Belorussii (Minsk), no. 8, 1978 p 63-68

Copyright. Avail: NTIS HC A04/MF A01

An article is presented on the planning for improvements in the automated control system for industrial production. The economic, component, organizational and technical factors involved in the development of such a system are discussed.
G.Y.

N79-14261# Joint Publications Research Service, Arlington, Va.
PROBLEMS ON EFFICIENT INTRODUCTION OF ASU'S CITED
S. Salimov *In its* Transl. on USSR Sci. and Technol.: Phys. Sci. and Technol., No. 55 (JPRS-72351) 1 Dec. 1978 p 20-29 Transl. into ENGLISH from Ekon. i Zhizn (Tashkent), no. 4, 1978 p 51-56
Copyright. Avail: NTIS HC A04/MF A01

During the 9th Five-Year Plan and during the first two years of the 10th Five-Year Plan more than 90 automated control systems (ASU's) were created and introduced at enterprises and in the ministries of Uzbekistan. The experience in creating ASU's shows they represent an important potential for enhancing the effectiveness production. It is noted that there still exists considerable potential for further reducing cost and increasing effectiveness of functioning and newly planned systems. An attempt is made to uncover this potential by examining the factors reducing the effectiveness of ASU's.
G.Y.

N79-14627# Cambridge Systematics, Inc., Mass.
IMPLEMENTATION AND ADMINISTRATION OF AIR QUALITY TRANSPORTATION CONTROLS: AN ANALYSIS OF THE DENVER, COLORADO AREA Final Report, Jun. 1976 - Jul. 1978
J. H. Suhrbier, E. A. Deakin, L. A. Neumann, C. R. Kern, W. P. Stern, A. B. Rappaport, and G. Harvey Apr. 1978 608 p refs Sponsored in part by EPA
(Contract DOT-OS-60173)
(PB-286353/8; DOT-P-78-001) Avail: NTIS HC A99/MF A01 CSCL 13B

The costs and benefits associated with the implementation and administration of transportation air quality measures required under the Clean Air Act were studied using the Denver Air Quality Control Region as a case example. The problems encountered by a number of metropolitan areas in their efforts to implement EPA Transportation Control Plans (TCP's) are discussed. Program measures examined are vehicle inspection and maintenance, ride sharing, preferential treatment for high occupancy vehicles, parking management, bicycling and transit. Impacts are described on legal and institutional considerations, urban economics, public administration, zoning, land management, travel behavior and conditions, motor vehicle regulation, capital enforcement costs, air quality, energy and safety. Emphasis is placed on the particular groups of institutions affected and on determination of relative importance of various costs and benefits associated with implementation.
GRA

N79-14760# Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON USSR SCIENCE AND TECHNOLOGY: BIOMEDICAL AND BEHAVIORAL SCIENCES, NO. 52
12 Jan. 1979 107 p refs Transl. into ENGLISH from various Russian journals
(JPRS-72604) Copyright. Avail: NTIS HC A06/MF A01

Various planning methods applicable to scientific medical research are discussed. Problem-oriented program approach, principles of automation, systems analytic approach, and classification of biomedical data for information retrieval systems are among the topics covered.

N79-14761# Joint Publications Research Service, Arlington, Va.
A COMPLEX SYSTEM FOR PLANNING SCIENTIFIC MEDICAL RESEARCH
A. M. Chernukh, G. V. Pogodayev, and B. V. Morozov *In its* Transl. on USSR Sci. and Technol.: Biomed. and Behavioral Sci., No. 52 (JPRS-72604) 12 Jan. 1979 p 25-30 refs Transl. into ENGLISH from Vestn. Akad. Med. Nauk SSSR (Moscow), no. 9, 1978 p 3-7

Copyright. Avail: NTIS HC A06/MF A01

Formation of a standard plan of scientific research on the basis of comprehensive analysis and subsequent evaluation of the future development of different directions of medical science, combining them with one another and other branches of science and technology is discussed. Emphasis is placed on the improvement of the system of planning and coordination of scientific research.
J.M.S.

N79-14762# Joint Publications Research Service, Arlington, Va.
PROBLEM-ORIENTED PROGRAM APPROACH TO PLANNING AND MANAGEMENT OF MEDICINE
A. M. Chernukh, A. B. Petrovskiy, and O. V. Filippov *In its* Transl. on USSR Sci. and Technol.: Biomed. and Behavioral Sci., No. 52 (JPRS-72604) 12 Jan. 1979 p 31-38 refs Transl. into ENGLISH from Vestn. Akad. Med. Nauk SSSR (Moscow), no. 9, 1978 p 8-14

Copyright. Avail: NTIS HC A06/MF A01

The ways and means of organizing and managing medical science in the USSR are considered in terms of intensification of the special purpose or problem-oriented aspect of planning scientific research. Advantages of the method of special purpose programmed planning are listed along with problems that could be developed on the basis of the special purpose programmed approach.
J.M.S.

N79-14763# Joint Publications Research Service, Arlington, Va.
NEW PRINCIPLES OF AUTOMATION OF BIOMEDICAL RESEARCH
V. P. Kaznacheyev, M. B. Shtark, Yu. K. Postoyenko, A. A. Kiselev, and V. N. Burakovskiy *In its* Transl. on USSR Sci. and Technol.: Biomed. and Behavioral Sci., No. 52 (JPRS-72604) 12 Jan. 1979 p 39-53 refs Transl. into ENGLISH from Vestn. Akad. Med. Nauk SSSR (Moscow), no. 9, 1978 p 14-26

Avail: NTIS HC A06/MF A01

The application of automation and computer technology to the development of modern biomedical research is discussed. The selection of the appropriate general purpose processing equipment in the form of a particular class of computer and a set of peripherals that link the object or experimenter directly to the computer is emphasized. The organization of the SAMBI system is given including its main elements and functions. Control algorithms which implement real time control of the heart rhythm, arterial pressure, central venous pressure, and respiratory rhythm are described.
J.M.S.

N79-14764# Joint Publications Research Service, Arlington, Va.
THE CONCEPTION OF THE SYSTEMS ANALYTIC APPROACH TO PLANNING AND ORGANIZATION OF MEDICAL SCIENTIFIC RESEARCH
S. A. Gasparyan *In its* Transl. on USSR Sci. and Technol.: Biomed. and Behavioral Sci., No. 52 (JPRS-72604) 12 Jan. 1979 p 54-60 refs Transl. into ENGLISH from Vestn. Aka. Med. Nauk SSSR (Moscow), no. 9, 1978 p 26-30
Copyright. Avail: NTIS HC A06/MF A01

The need to develop a classification of medical problems is addressed. Specifically, six classes of scientific medical problems are discussed in terms of planning and organization of medical science research.
J.M.S.

N79-14765# Joint Publications Research Service, Arlington, Va.

CURRENT STATUS AND PROSPECTS OF CONTINUED REFINEMENT OF PLANNING AND COORDINATION OF SCIENTIFIC MEDICAL RESEARCH

A. A. Kiselev, L. Ya. Pimenova, and O. V. Filippov *In its* Transl. on USSR Sci. and Technol.: Biomed. and Behavioral Sci., No. 52 (JPRS-72604) 12 Jan. 1979 p 61-70 refs Transl. into ENGLISH from Vestn. Akad. Med. Nauk SSSR (Moscow), no. 9, 1978 p 30-37

Copyright. Avail: NTIS HC A06/MF A01

The connection between recognized social needs and the probabilistic nature of the process of scientific search for the means to meet these needs is discussed. Emphasis is placed on the administration of financial support of biomedical research. The intensification and expansion of studies and the coordinated distribution of resources in accordance with the objective structure of social and scientific priorities are among the topics considered. J.M.S.

N79-14766# Joint Publications Research Service, Arlington, Va.

THE SYSTEMS ANALYTIC APPROACH TO THE PROBLEM OF CLASSIFICATION OF SCIENTIFIC MEDICAL RESEARCH

A. A. Kiselev, A. B. Petrovskiy, and L. A. Pimenova *In its* Transl. on USSR Sci. and Technol.: Biomed. and Behavioral Sci., No. 52 (JPRS-72604) 12 Jan. 1979 p 71-81 refs Transl. into ENGLISH from Vestn. Akad. Med. Nauk SSSR (Moscow), no. 9, 1978 p 38-43

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The administration of medical science is addressed in terms of gathering and processing needed information in order to: (1) evaluate current status, trends of development, and potential of different scientific directions; (2) determine and distribute scientific potential of medicine; and (3) coordinate research with due consideration of the mutual influences of different directions, their contribution to public health practice, and solution of other national problems. Application of automated information retrieval systems to permit a multiaspect search for information needed by administrative bodies is considered with emphasis on the development of a classification system for medical science. J.M.S.

N79-14767# Joint Publications Research Service, Arlington, Va.

USE OF THE SYSTEMS ANALYTIC APPROACH FOR ORGANIZATION AND COORDINATION OF COMPLEX BIOMEDICAL RESEARCH

G. I. Mchedlishvili and M. K. Babunashvili *In its* Transl. on USSR Sci. and Technol.: Biomed. and Behavioral Sci., No. 52 (JPRS-72604) 12 Jan. 1979 p 82-93 refs Transl. into ENGLISH from Vestn. Akad. Med. Nauk SSSR (Moscow), no. 9, 1978 p 43-50

Avail: NTIS HC A06/MF A01

Application of systems theory to the management and planning of biomedical research is addressed. Decision making theories applicable to problems pertaining to planning, control, and forecasting of scientific research are emphasized. J.M.S.

N79-14781# National Technical Information Service, Springfield, Va.

HUMAN WORK MEASUREMENT. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Oct. 1978

Carolyn A. Shonyo Nov. 1978 175 p Supersedes NTIS/PS-77/1054; NTIS/PS-76/0945; NTIS/PS-75/797 (NTIS/PS-78/1197/9; NTIS/PS-77/1054; NTIS/PS-76/0945; NTIS/PS-75/797) Avail: NTIS HC $28.00/MF $28.00 CSCL 05I

Reports dealing with measurement techniques of human work at jobs and tasks are summarized. Specific topics included are work analysis and evaluation, workload management, operations analysis, task complexity, and performance measurement. This bibliography contains 168 abstracts. GRA

N79-14918# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

DEVELOPMENT OF AN AIR FORCE FACILITIES ENERGY INFORMATION SYSTEM M.S. Thesis

David F. Manchester and Ronald L. Schuldt Jun. 1978 156 p refs

(AD-A059309; AFIT-LSSR-8-78A) Avail: NTIS HC A08/MF A01 CSCL 05/2

There is some doubt about whether or not Air Force Civil Engineering personnel, who are responsible for the planning, construction, operation, and maintenance of all Air Force facilities, have the proper background information to cope with the current energy crisis. This thesis analyzes the results of a survey of over 500 Civil Engineering officers and equivalent civilians on the subject of energy information. The analysis shows that, in spite of the recent interest in energy, very few managers feel that they have enough background information to make educated decisions about energy problems in their functional areas. Seventy-seven percent of the respondents feel that Civil Engineering needs an energy background information system. Based on questionnaire responses, readings, and interviews, the requirements for such a system are discussed. Sources of energy information which should be incorporated into an Air Force Energy Information System are described. The system could be established during the current headquarters reorganization. Author (GRA)

N79-14919# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

THE APPLICATION OF SYSTEM DYNAMICS TO A MANAGERIAL MODEL OF AERONAUTICAL SYSTEMS DIVISION M.S. Thesis

Jerry L. Elder and Michael B. Nixon Jun. 1978 120 p refs

(AD-A059312; AFIT-LSSR-22-78A) Avail: NTIS HC A06/MF A01 CSCL 05/1

Models presently available to Air Force managers are restricted in their use to particular functional areas, e.g., manpower and cost-estimating models. Extensive research has indicated that useful and comprehensive managerial models of large, complex military organizations have not been developed. The purpose of this research is to develop a model of the managerial decision structure and important information, material, and fund flows which are directly relevant to ASD's mission (planning and managing the acquisition of aeronautical systems, subsystems, and associated equipment). Such a model would aid in the top level policy-making process and in understanding the system's behavior. System dynamics appears to provide a most suitable methodology for this model development. This initial effort is limited to the development of: (1) a general conceptual model of the process by which ASD's mission is now accomplished, and (2) a detailed operating model of one segment of the general model--the process of project management--providing an example of how the general model could be further developed. Author (GRA)

N79-14920# Space and Missile Systems Organization, Los Angeles Air Force Station, Calif.

PROCEEDINGS OF INDUSTRY/SAMSO CONFERENCE AND WORKSHOP ON MISSION ASSURANCE

1978 301 p Conf. held at Los Angeles, 25-27 Apr. 1978

(AD-A059654; SAMSO-TR-78-58) Avail: NTIS HC A14/MF A01 CSCL 22/2

Partial Contents: Design considerations and responsibilities for Mission Assurance; The role of contractual incentives in Management Motivation for Mission Assurance; The role of Management and Program Review Process in Mission Assurance; Techniques for management and control of the development and application of systems computer software; Subcontractor/supplier interface and control to achieve Mission Assurance; Development and Control of microelectronics/hybrids for space application; Identification and examination of manufacturing and assurance techniques required to minimize mission risk; Optimization of testing of components, subsystems, and systems for Mission Assurance; and Industry's approach to personnel motivation and training and SAMSO/Aerospace /Industry experience sharing. GRA

N79-14921# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

A COST ANALYSIS ON PROCURING IMPROVED TECHNICAL ORDER DATA FOR THE F-15 WEAPON SYSTEM M.S. Thesis

Robert Wilmer Bennett and William D. K. Moravek Jun. 1978 152 p refs

(AD-A059571; AFIT-LSSR-27-78A) Avail: NTIS HC A08/MF A01 CSCL 01/3

The United States Air Force has expressed strong interest in finding methods of reducing weapon system maintenance cost. One method is to increase the productivity of maintenance personnel by providing better technical data. High maintenance personnel cost makes it imperative that a more efficient, improved, proceduralized TO (PTO) format be developed and utilized. Due to the inherent advantages of PTOs, the F-15 Technical Order Management Agency manager is in the process of evaluating the cost of converting the F-15 TOS to the PTO format. A cost versus benefits analysis of the advantages and disadvantages of PTOs has been accomplished to assist top level management in deciding the appropriate type TO option to procure. To accomplish the analysis this thesis identifies the steps in the TO procurement process, explains the techniques used by McDonnell-Douglas Aircraft Company to develop cost estimates for the F-15 weapon system TOs, describes the advantages of procuring the F-15 weapon system TOs in the PTO format, and estimates where possible the monetary savings derived from the advantages of the improved PTO format. This thesis concludes that the F-15 weapon system technical data should be procured in the PTO format. Author (GRA)

N79-14922# California Univ., Livermore. Lawrence Livermore Lab.

FTE: A RESOURCE-ALLOCATION PROGRAM FOR MANAGERS

Peter Keller 15 Oct. 1977 101 p

(Contract W-7405-eng-48)

(UCRL-52244) Avail: NTIS HC A06/MF A01

FTE creates charts that show quickly how time and resources are being allocated. The FTE chart is an easy-to-digest chart showing trends and relationships. It is a useful tool for the planning and communication of ideas at all levels of management in private industry and government. Although it does not replace the detailed analysis of data needed for accurate planning, it does show the overall picture. This overview must first be understood before the details can be accurately interpreted. FTE is written in LRLTRAN and runs on the CDC 7600 computers of the Livermore timesharing network. DOE

N79-14923# General Accounting Office, Washington, D. C. Procurement and Systems Acquisition Div.

FEDERALLY SPONSORED RESEARCH AT EDUCATIONAL INSTITUTIONS: A NEED FOR IMPROVED ACCOUNTABILITY

18 Aug. 1978 37 p

(PB-285770/4; PSAD-78-135) Avail: NTIS HC A03/MF A01 CSCL 05A

Educational institutions receive about $3.8 billion a year through Federal grants and contracts for the conduct of research. Under present systems and methods in use at educational institutions, the Federal Government cannot reasonably be assured that Federal funds are effectively being used for specific research objectives. Many of the problems discussed in this report are the result of the wide latitude and flexibility given to educational institutions by Federal Management Circular 73-8. Strengthening the cost principles is required since the absence of more definite guidance has resulted in varying interpretations and practices and in much disagreement between the Federal Government and educational institutions. GRA

N79-14924# General Accounting Office, Washington, D. C. Health Resources Div.

NEED FOR INCREASED EMPHASIS ON TIMELY CONTRACT AND GRANT CLOSEOUT ACTIVITIES

21 Sep. 1978 12 p

(PB-285926/2; HRD-78-142) Avail: NTIS HC A02/MF A01 CSCL 05A

In October 1975, GAO reported that the Department of Labor's Employment and Training Administration had a large backlog of expired contracts and grants which had not been closed out. That little improvement was made through March 31, 1978 in this follow up survey. Labor needs to place increased emphasis on timely closeout activities to help assure that Federal funds are fully accounted for. GRA

N79-14926# Metropolitan Washington Council of Governments, D. C.

A DEMONSTRATION OF AREAWIDE WATER RESOURCES PLANNING. USER'S MANUAL Final Report

C. S. Sponner, J. Promise, and P. H. Graham Apr. 1978 207 p refs

(Contract EPA-68-01-3704)

(PB-286205/0; EPA-600/5-78-006B) Avail: NTIS HC A10/MF A01 CSCL 13B

A demonstration of areawide water resources planning by the Metropolitan Washington, D.C. Council of Governments (MWCOG) is documented. A framework water resources planning model is a comprehensive analytical tool for use in areawide planning. The physical simulation portion was formed by linking component computer models which test alternative future community development patterns by small area, estimate water demands by usage categories, calculate sewage flows based on water demands and add infiltration/inflow simulate stormwater runoff, test application of alternative waste treatment management systems, and simulate the quality response of the region's major water body. GRA

N79-14929*# National Aeronautics and Space Administration, Washington, D. C.

RESEARCH AND TECHNOLOGY OBJECTIVES AND PLANS SUMMARY (RTOPS). RESEARCH AND TECHNOLOGY PROGRAM, FISCAL YEAR 1979

1979 142 p

(NASA-TM-80035) Avail: NTIS HC E02/MF E02 CSCL 05B

A compilation of the summary portions of each of the Research and Technology Operating Plans (RTOP) used for management review and control of research currently in progress throughout NASA is presented along with citations and abstracts of the RTOPs. Indexes include: subject; technical monitor; responsible NASA organization; and RTOP number. F.O.S.

N79-14936# Federal Data Processing Reorganization Project, Washington, D. C.

FEDERAL DATA PROCESSING REORGANIZATION STUDY: HUMAN RESOURCES TEAM REPORT Final Report

Robbin R. Hough (Oakland Univ.), J. Gary Augustson (DOT, Washington, D. C.), John M. Daugherty (Office of the Chief of Staff (Army), Gerald T. Hedlund (Gen. Foods Corp.), Peter B. Henault (Seattle City Lght), and David Hirschberg (Bureau of Econ. Analysis) Sep. 1978 213 p refs Sponsored by Office of Management and Budget

(PB-287174/7) Avail: NTIS HC A10/MF A01 CSCL 09B

The way in which the Federal Government acquires, manages, and uses information technology was investigated in the following agencies responsible for the delivery of human services: the Department of Health, Education and Welfare, Housing and Urban Development, Labor, and Veterans Administration. Current management of information technology is described for each agency. The extent and causes of real or perceived problems are documented and viable options are identified and analyzed as solutions to those problems. Recommendations for improvement are suggested. GRA

N79-14937# Federal Data Processing Reorganization Project, Washington, D. C.

FEDERAL DATA PROCESSING REORGANIZATION STUDY: PERSONNEL TEAM REPORT Final Report

James McManama (City of Dayton, Ohio), Ray Demarest (Civil Serv. Comm.), Israel Feldman (Dept. of Housing and Urban Develop.), Vincent Guidace (Air Force Data Serv. Center), David Skeen (Dept. of the Navy), Stephen J. Stofko (US House of Representatives), and Carol M. Vaughan (Bureau of the Census) Sep. 1978 129 p refs Sponsored by Office of Management and Budget
(PB-287175/4) Avail: NTIS HC A07/MF A01 CSCL 09B

The current management of personnel involved in federal information technology is assessed and recommendations are made for improving the way in which the Federal Government acquires, manages and uses information technology. Topics discussed include personnel development, specialized training, job analysis, and manpower utilization. GRA

N79-14938# Federal Data Processing Reorganization Project, Washington, D. C.
FEDERAL DATA PROCESSING REORGANIZATION STUDY: OPERATIONAL MANAGEMENT TEAM REPORT Final Report
Philip J. Kiviat (Federal Computer Performance Evaluation and Simulation Center), Jerry R. Berry (Tenneco, Inc.), Thomas Giammo (Social Security Admin.), and Donald A. Marchand (South Carolina Univ., Columbia) Sep. 1978 206 p refs Sponsored by Office of Management and Budget
(PB-287176/2) Avail: NTIS HC A10/MF A01 CSCL 09B

The management of information technology in federal agencies from the time a decision is made to implement a data processing supported system until its replacement or termination was investigated. Specific aspects of operational management discussed include: the systems development process; software sharing; cost accounting for data processing; installation management; confidentiality and security; evaluation and audit; and technical assistance. The earned autonomy concept which deals with the desirable balance between agency autonomy and central control and direction is examined. Recommendations are given for improving Federal management in all seven areas.GRA

N79-14941# General Accounting Office, Washington, D. C. Program Analysis Div.
PROGRESS IN IMPROVING PROGRAM AND BUDGET INFORMATION FOR CONGRESSIONAL USE Report to the Congress
29 Aug. 1978 47 p refs
(PB-285812/4; PAD-78-78) Avail: NTIS HC A03/MF A01 CSCL 05A

By laws the Comptroller General conducts a program to develop standard terms and classifications for Federal fiscal, budgetary, and program-related information; to identify congressional needs for such information; and to monitor recurring reporting requirements of the Congress and make recommendations for changes in these requirements. This annual report, required by title 8 of the Congressional Budget Act of 1974, summarizes GAO's work in these areas over this past year. GRA

N79-14943# General Accounting Office, Washington, D. C. Procurement and Systems Acquisition Div.
DEVELOPMENT OF A NATIONAL MAKE-OR-BUY STRATEGY: PROGRESS AND PROBLEMS Report to Congress
25 Sep. 1978 166 p
(PB-286384/3; PSAD-78-118) Avail: NTIS HC A08/MF A01 CSCL 05D

GAO's assessment of the executive branch's policies and programs for obtaining commercial or industrial products and services for Government use is reported. It discusses the history and evolution, the overall perceptions, the status of implementation, the major problems and influences, and the proposed changes to the current policy. GRA

N79-14960# Booz-Allen and Hamilton, Inc., Philadelphia, Pa.
SEPTA MANAGEMENT STUDY Final Report
May 1978 72 p refs Sponsored by Southeastern Pennsylvania Transportation Authority, UMTA, and Delaware Valley Regional Planning Commission Prepared in Cooperation with Price Waterhouse and Co., Philadelphia, Pa.
(PB-285010/5; UMTA-PA-09-0039-78-1) Avail: NTIS HC A04/MF A01 CSCL 13B

The SEPTA Management Study was commissioned by SEPTA's funding governments to evaluate how well this mission was being performed in consideration of the agency's budget constraints, and to make specific improvement recommendations. A series of diagnostics (peer group comparison, case studies, flow charts, and organizational analysis) to identify areas where SEPTA performance appeared unusual were studied. Serious deficiencies are identified in nine functional areas (Cash Handling, ConRail Purchase-of-Service Agreement, Surface Transit Operations Planning, Vehicle Utilization, Surface Transit Maintenance, Capital Project Management, and Regional Fare Integration) and seven additional improvement areas. The roles of the SEPTA Board and SEPTA's funding agencies are discussed. Specific actions, including organizational changes, are recommended which will yield near-term benefits.

N79-15320# Florida State Univ., Tallahassee. Dept. of Statistics.
NONPARAMETRIC METHODS WITH APPLICATIONS TO RELIABILITY Final Report, 1 Oct. 1976 - 30 Sep. 1978
Myles Hollander Sep. 1978 23 p refs
(Grant AF-AFOSR-3109-76; AF Proj. 2304)
(AD-A060371; AFOSR-78-1413TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

During the period (October 1, 1976 through September 30, 1978) under review, the principle investigator was mainly interested in the development of various methods in nonparametric and Bayesian inference with applications that are particularly relevant to reliability studies. Twelve technical reports were produced under this grant, and six articles were published in technical journals. Author (GRA)

N79-15322# Kentucky Univ., Lexington. Dept. of Statistics.
COMPREHENSIVE RESEARCH ON THE RELIABILITY AND PERFORMANCE OF SYSTEMS AND COMPONENTS ASSUMING MORE THAN TWO STATES Interim Report, 1 Jun. 1977 - 31 May 1978
Emad El-Neweihi May 1978 9 p refs
(Grant AF-AFOSR-3322-77)
(AD-A060415; AFOSR-78-1411TR) Avail: NTIS HC A02/MF A01 CSCL 14/4

The vast majority of reliability analyses assume that components and systems are in either of two states; functioning or failed. This represents an oversimplification of the many real life situations in which both components and systems assume a variety of states ranging from perfect functioning to complete failure. In the present work a basic theory was developed for the study of systems of components in which any of a finite number of states may occur, representing at one extreme perfect functioning and at the other extreme complete failure. The standard notion of Coherent Systems was extended to the new notion of a multistate coherent system. GRA

N79-15654# Army Construction Engineering Research Lab., Champaign, Ill.
CLEARINGHOUSE INFORMATION SYSTEM: DESCRIPTION AND USER INSTRUCTIONS Final Report
R. D. Webster and Brenda Griffin Aug. 1978 17 p
(AD-A059176; CERL-TR-N-53) Avail: NTIS HC A02/MF A01 CSCL 09/2

The Clearinghouse Information System (CHIS), a computerized subsystem of the Environmental Technical Information System (ETIS) is developed. Users are provided with up-to-date listings of state, regional, or local clearinghouse agencies with which Federal agencies must coordinate new projects or activities. The information provided by these clearinghouses will prevent duplication of Federal and local efforts and insure compatibility of project planning. The user instructions and guidance for retrieving and using appropriate information to coordinate Department of the Army Environmental Impact Assessments and Environmental Impact Statements with state and local agencies are presented. S.E.S.

N79-15674*# Aerospace Corp., El Segundo, Calif. Advanced Programs Div.
THE DETERMINATION OF MEASURES OF SOFTWARE RELIABILITY Final Report
F. D. Maxwell and B. C. Corn Dec. 1978 118 p refs
(Contract NAS1-14392)
(NASA-CR-158960; ATR-79(7590)-1) Avail: NTIS HC A06/MF A01 CSCL 09B

Measurement of software reliability was carried out during the development of data base software for a multi-sensor tracking system. The failure ratio and failure rate were found to be consistent measures. Trend lines could be established from these measurements that provide good visualization of the progress on the job as a whole as well as on individual modules. Over one-half of the observed failures were due to factors associated with the individual run submission rather than with the code proper. Possible application of these findings for line management, project managers, functional management, and regulatory agencies is discussed. Steps for simplifying the measurement process and for use of these data in predicting operational software reliability are outlined. Author

N79-15676*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
STANDARDIZED DEVELOPMENT OF COMPUTER SOFTWARE. PART 2: STANDARDS
Robert C. Tausworthe Aug. 1978 559 p refs
(Contract NAS7-100)
(NASA-CR-158070; JPL-SP-43-29-PT-2) Avail: NTIS HC A24/MF A01 CSCL 09B

This monograph contains standards for software development and engineering. The book sets forth rules for design, specification, coding, testing, documentation, and quality assurance audits of software; it also contains detailed outlines for the documentation to be produced. G.G.

N79-15682# Inco, Inc., McLean, Va.
STANDARD SOFTWARE BASE (SSB) RELEASE 3 Final Technical Report, 26 Aug. 1976 - 28 Feb. 1978
Thomas Trump Jul. 1978 72 p
(Contract F30602-77-C-0046)
(AD-A059647; INCO/1073-378-TR-26-D(F); RADC-TR-78-167) Avail: NTIS HC A04/MF A01 CSCL 09/2

The Standard Software Base (SSB) was developed to provide a common inventory of modular software tools with which AN/GYQ-21(V) system users could quickly and effectively develop and implement data systems unique to their site-specific requirements. The specific objectives of the SSB system include: (1) Establishment of a common standard technological software base supporting the development of applications programs, and overall implementation of AN/GYQ-21(V) systems. (2) Elimination of duplicate development efforts and shortening implementation schedules. (3) Development and delivery of comprehensive system documentation and software releases to user activities. (4) Development of a comprehensive training program to equip Air Force personnel with the knowledge required to develop mobile on-site SSB training teams. Author

N79-15814# National Science Foundation, Washington, D. C. Directorate for Science Education.
CONTINUING EDUCATION IN SCIENCE AND ENGINEERING Final Report
Dec. 1977 262 p refs
(PB-286213/4; SE-78-5) Avail: NTIS HC A12/MF A01 CSCL 05I

An analysis of information on the employment and availability of scientific and engineering personnel, an account of an experts' conference in August, 1977, and six commissioned papers are reported. Three generalizations may be ventured from the many complex ideas presented: (1) 'continuing education' has become distinguished from advanced education, i.e., is for maintaining or diversifying skills of employed professionals; (2) course-taking is less significant in continuing education than elements of the work environment, e.g., job design, supervision, and incentive systems; (3) although no clear national need emerges to justify federal subsidy of delivery of continuing education, studies, research and policy analysis are suggested to better understand the problem and further specify the federal role. GRA

N79-15815# Committee on Science and Technology (U. S. House).
UNITED STATES CIVILIAN SPACE PROGRAMS: AN OVERVIEW
Marcia S. Smith, George N. Chatham, Christopher H. Dodge, Barbara A. Luxenberg, Leni H. Raleigh, and Charles S. Sheldon, II Washington GPO 1979 180 p refs Rept. for Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 95th Congr., 2d Sess., Dec. 1978 Prepared by the Library of Congr., Congressional Res. Service
(GPO-35-823) Avail: SOD HC

An overview of NASA's history and its relationship to U.S. space policy is presented as well as a synopsis of the achievements and benefits derived from a many-faceted nonmilitary space program. Issues identified for congressional consideration of specific elements of a cohesive space policy relate to: (1) NASA as an organization; (2) NASA centers and facilities; (3) launch vehicles and propulsion; (4) applications satellites; (5) NASA tracking stations and the TDRSS; (6) space shuttle; (7) space sciences; (8) space life sciences; (9) materials processing in space; (10) international space programs; (11) domestic technology utilization; and (12) NASA university support. A.R.H.

N79-15817# Naval Research Lab., Washington, D. C. Computer Science Lab.
A STUDY OF MANAGEMENT INFORMATION SYSTEM NEEDS FOR THE ELECTROMAGNETIC COMPATIBILITY LABORATORY OF THE NAVAL AIR TEST CENTER
Gerald A. Wilson May 1978 28 p refs
(AD-A057688; AD-E000184; NRL-MR-3775) Avail: NTIS HC A03/MF A01 CSCL 05/1

The requirements and utility of management information systems to support the EMC/EMI effort are reported. Those aspects of the work performed by the EMC lab of NATC which might benefit from the support of a management information system, were investigated and the most cost effective manner for installing such a system was recommended. It was determined that there are two distinct, though closely related, needs for management information which exist in the EMC laboratory of NATC. The first requirement is a system to manage a data base of aircraft equipment and component specifications. This would be used by the engineers and technicians performing EMC/EMI testing and evaluation of aircraft. The second requirement is a management information system to maintain and generate necessary reports. B.B.

N79-15818# Texas A&M Univ., College Station. Inst. of Statistics.
PROJECT SCHEDULING WITH DISCONTINUOUS PIECEWISE CONVEX ACTIVITY COST FUNCTIONS
Christian C. Robieux and Robert L. Sielken, Jr. Sep. 1978 25 p refs
(Contract N00014-78-C-0426)
(AD-A060500; THEMIS-TR-61) Avail: NTIS HC A02/MF A01 CSCL 09/2

When an activity can be performed with different techniques, the activity cost function may be a discontinuous piecewise convex function of the activity's duration. This makes the determination of the minimum cost schedule satisfying a specified project deadline a nonconvex problem. However, if an activity may be performed using a combination of the different techniques, the concept of a convex hull can be used to transform the activity's cost function. The resulting convex problem can be soived by the existing PERT procedures. Therefore, this paper extends the applicability of existing PERT procedures to problems with

discontinuous piecewise linear or piecewise convex activity cost functions. Author (GRA)

N79-15819# Texas A&M Univ., College Station. Inst. of Statistics

A USER'S GUIDE TO THE COMPUTER IMPLEMENTATION OF THE NEW PROJECT SCHEDULING PROCEDURE: STATISTICAL PERT

Thomas C. Baker, Jr. and Robert L. Sielken, Jr. Aug. 1978 302 p

(Contract N00014-78-C-0426)

(AD-A060568; THEMIS-TR-57) Avail: NTIS HC A14/MF A01 CSCL 09/2

This report documents a new project scheduling algorithm which is a five step iterative procedure capable of determining a minimum cost project schedule when the activities making up the project have durations which are random variables. The cost of an activity is assumed to be a convex piecewise linear function of the activity's mean duration. The problem is to determine the activity mean durations which both minimize the total project cost and insure that the mean (or some specified percentile) of the corresponding project completion time distribution is less than or equal to a specified project deadline. Information on the trade-off between the project's minimum cost and its specified deadline is also provided. This report is intended as a user's guide to the new project scheduling procedure and its computer implementation. The report includes a description of the project scheduling problem a general overview of the scheduling procedure including references to technical reports documenting the development of the procedure, and an example of the procedure's performance. The documentation of the computer implementation includes specific input instructions; sample input and output; flowcharts; individual program descriptions; technical details concerning temporary data sets, job control language, and program interruption and restart procedures; and program listings. GRA

N79-15820# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

A PROPOSED CONCEPTUAL MODEL FOR THE INTEGRATION OF ZERO-BASE BUDGETING INTO THE RESOURCE MANAGEMENT SYSTEM AT THE BASE LEVEL M.S. Thesis

Robert J. Conner and David B. Walker Sep. 1978 248 p refs

(AD-A060489; AFIT-LSSR-4-78B) Avail: NTIS HC A11/MF A01 CSCL 05/1

A major impact of zero-base budgeting (ZBB) in the Air Force will be on the role of the base-level managers. The problem for the Air Force is to integrate the philosophy of centralized planning, programming and budgeting with the concept of operating management participation in a bottom-up ZBB process. The objective of this research is to develop a conceptual model of ZBB as it could be applied at base level in the Air Force and to provide support for the appropriateness of the proposed model by using an opinion survey of base-level responsibility center managers and resource advisors. A conceptual model is presented and results of the opinion survey are used to validate aspects of the model. The opinion survey also includes questions pertaining solely to the attitudes of the base-level managers toward the zero-base budgeting process. The conclusion of the research is that, while there are several problems in the implementation of ZBB at base level, the responsible center managers and resource advisors can perform the functions required by ZBB. The proposed model was supported in part by the results of the survey. Recommendations and areas for further study are presented. Author (GRA)

N79-15821# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

APPLICATION OF LIFE CYCLE COSTING PRINCIPLES TO LESS THAN MAJOR PROGRAMS M.S. Thesis

Joseph P. Culp and Steven D. Novy Sep. 1978 108 p refs

(AD-A060772; AFIT-LSSR-6-78B) Avail: NTIS HC A06/MF A01 CSCL 15/5

This study examined ten current life cycle cost (LCC) procurements of aircraft subsystems and equipment. The objectives of the research were to identify potential LCC problem areas, to consolidate lessons learned from past and on-going LCC-oriented programs, and to provide the basis for development of an improved and simplified LCC guidance document for the program manager. The methodology used was a combination of literature review and interviews with personnel within ASD currently responsible for various aspects of LCC. The interviews focused primarily on program managers, but included others involved with contracting, testing, engineering, and LCC modeling. The study is organized into areas covering early program considerations, models and data inputs, request for proposal and source selection, negotiation, contracting, and incentive considerations, LCC verification testing, and lessons learned.Author (GRA)

N79-15822# Wright State Univ., Dayton, Ohio.

MANPOWER IMPLICATIONS IN THE DESIGN OF AIR FORCE EQUIPMENT Final Report, 1 Jun. 1973 - 31 Aug. 1976

M. L. Ritchie Feb. 1978 7 p

(Grant AF-AFOSR-2569-73)

(AD-A059423; HFE-78-1) Avail: NTIS HC A02/MF A01 CSCL 05/1

The manpower portion of operations and support costs are increasing despite success in establishing principles and the data base upon which Air Force design activities proceed. The problem of influencing engineering design to result in more effective incorporation of operating and supporting cost variables is addressed. The general lack of design education in the preparation of engineers is considered and suggestions are made for changing design procedures and for further research. A.R.H.

N79-15823# National Technical Information Service, Springfield, Va.

DESIGN TO COST AND LIFE CYCLE COSTING, VOLUME 3. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, Dec. 1976 - Nov. 1977

Guy E. Habercom, Jr. Dec. 1978 176 p

(NTIS/PS-78/1249/8) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

Management control methods for cost effectiveness of systems and systems design are investigated in these research reports. Federal, municipal, and industrial applications of the developed philosophies are reported. GRA

N79-15824# National Technical Information Service, Springfield, Va.

DESIGN TO COST AND LIFE CYCLE COSTING, VOLUME 4. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, Dec. 1977 - Nov. 1978

Guy E. Habercom, Jr. Dec. 1978 246 p Supersedes NTIS/PS-77/1145; NTIS/PS-76/-1036; NTIS/PS-75/875 (NTIS/PS-78/1250/6; NTIS/PS-77/1145; NTIS/PS-76/1036; NTIS/PS-75/875) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

An updated bibliography containing 238 abstracts, all of which are new entries to the previous edition, is presented. Management control methods for cost effectiveness of systems and systems design are investigated in these research reports. G.Y.

N79-15835# Committee on Appropriations (U. S. House).

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, INDEPENDENT AGENCIES APPROPRIATIONS FOR 1979. PART 1: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington GPO 1978 1023 p refs Hearings before a subcomm. of the Comm. on Appropriations, 95th Congr., 2d Sess., 25 Jan. 1978

(GPO-23-738) Avail: Comm. on Appropriations

The role of NASA as an agency providing services to other government agencies, to the scientific community, to the public, and to other nations is reviewed in testimony presented to justify requests for appropriations for research and development, construction of facilities, and for research and program manage-

ment. Topics covered include the space transportation system, space sciences; aeronautical research and technology; energy technology and its applications; remote sensing; data processing; and space industrialization. Funding requirements for the various programs and for the operation of NASA centers are analyzed. A.R.H.

N79-15836# Committee on Commerce, Science, and Transportation (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1979. PART 4: INDEX
Washington GPO 1978 119 p Hearings on S. 2527 before the Subcomm. on Sci., Technol., and Space of the Comm. on Commerce, Sci., and Transportation, 95th Congr., 2d Sess., 1978
(GPO-36-905) Avail: Subcomm. on Sci., Technol., and Space
Testimony presented on the Senate in support of NASA's budget requests for various programs is indexed. A.R.H.

N79-15838# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1979, VOLUME 1, PARTS 1, 2, AND 3 AND VOLUME 2, PARTS 1, 2
Washington GPO 1979 167 p Index for hearings on H.R. 10664 (superseded by H.R. 11401) before the Comm. on Sci. and Technol., 95th Congr., 2d Sess., 1979
(GPO-38-083) Avail: Comm. on Sci. and Technol.
A subject and name index to the House hearings on NASA's request for appropriations to support research and development, construction of facilities, research and program management, and for other purposes is presented. A.R.H.

N79-15842# Chicago Univ., Ill. Dept. of Economics.
ECONOMICS OF MUNICIPAL SOLID WASTE MANAGEMENT: THE CHICAGO CASE Final Report
G. Tolley, V. S. Hastings, and G. Rudzitis Aug. 1978 118 p refs Sponsored by EPA
(PB-286360/3; EPA-600/8-78-013) Avail: NTIS HC A06/MF A01 CSCL 13B
An extension of the theory of demand is provided, with specific application to collection and disposal services for household solid waste. The empirical investigation involving several socioeconomic variables (income, race, household size) repeated the analysis of an earlier study, using more recent (1970) Census data. The current findings supported the earlier results indicating a strong positive effect and a seasonal pattern for waste volume and income elasticity. There was less evidence of racial influence and household size on the quantity of solid waste for municipal collection and disposal. GRA

N79-15846# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. VOLUME 1: AUTO RESTRICTED ZONES: BACKGROUND AND FEASIBILITY Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 184 p refs Prepared in cooperation with Cambridge Systematics, Inc., Mass. and Moore-Heder Architects, Cambridge, Mass.
(Contract DOT-TSC-1057)
(PB-286313/2; UMTA-VA-06-0042-78-1) Avail: NTIS HC A07/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B
The underlying characteristic of an auto restricted zone (ARZ) as discussed in this study is that of a district or zone distinguished by a higher degree of control over vehicular traffic than the surrounding area. The report discusses techniques for ARZ which were identified and categorized as physical, operational, economic, and regulatory control measures. The investigation of existing experience with ARZ focuses on U.S. cities and on European cities where the concept is most advanced, such as in Copenhagen, Amsterdam and Vienna, and discusses its similarities and differences. A number of key factors are identified for its successful implementation. GRA

N79-15847# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. VOLUME 2: MULTI-USER VEHICLE SYSTEMS: FEASIBILITY ASSESSMENT Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 105 p refs Prepared in cooperation with Cambridge Systematics, Inc., Mass.
(Contract DOT-TSC-1057)
(PB-286314/0; UMTA-VA-06-0042-78-2) Avail: NTIS HC A06/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B
Volume 2 documents the results of an investigation into the feasibility of Multi-User Vehicle Systems (MUVS) as a mode of urban transportation. The goals and objectives of MUVS are to: (1) alleviate congestion and improve traffic flow; (2) increase mobility; (3) provide an additional choice of mode; (4) reduce air pollution from vehicle emissions; (5) reduce noise; (6) conserve energy; and (7) reduce land requirements for parking. A detailed examination of a MUVS as a Central Business District (CBD) circulation service in Amsterdam and in Montpellier, France is presented. Various characteristics of each system are identified and compared. GRA

N79-15848# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. VOLUME 3: AUTO RESTRICTED ZONES: PLANS FOR FIVE CITIES Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 257 p Prepared in cooperation with Cambridge Systematics, Inc., Mass. and Moore-Heder Architects, Cambridge, Mass.
(Contract DOT-TSC-1057)
(PB-286315/19; UMTA-VA-06-0042-78-3) Avail: NTIS HC A12/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B
The application of some of the auto restricted zones (ARZ) techniques to downtown areas of five U.S. cities: Boston; Burlington; Memphis; Providence; and Tucson is discussed. Emphasis was on tailoring an ARZ plan to each specific urban environment rather than imposing a preselected strategy. The process began with a systematic examination of the existing downtown infrastructure and current plans and projects already underway were also assessed for impact toward ARZ planning. GRA

N79-15849# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. VOLUME 4: SITE SELECTION METHODOLOGY Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 72 p Prepared in cooperation with Cambridge Systematics, Inc., Mass. and Moore-Heder Architects, Cambridge, Mass.
(Contract DOT-TSC-1057)
(PB-286316/5; UMTA-VA-06-0042-78-4) Avail: NTIS HC A04/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B
Volume 4 presents methodology followed in the selection of sites for auto restricted zones (ARZ) demonstrations. Of more than 75 applicants, five cities were selected for participation: Boston; Burlington; Memphis; Providence; and Tucson. The report includes the design of site specific programs to demonstrate this methodology in the five selected cities. The program was structured into seven major work elements which are outlined in the study. In the review process for each city, indicators of past performance, present commitment, future planning in institutional performance, transportation factors, and urban form and opportunities were examined. Six basic criteria were submitted to each city and are presented in this report. GRA

N79-15850# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. TECHNICAL APPENDIX: BOSTON AUTO

RESTRICTED ZONE STUDY Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 155 p Prepared in cooperation with Cambridge Systematics, Inc., Mass., Moore-Heder Architects, Cambridge, Mass., and Kearney (A. T.) and Co., Inc., Chicago, Ill.
(Contract DOT-TSC-1057)
(PB-286317/3; UMTA-VA-06-0042-78-5) Avail: NTIS HC A08/MF A01 CSCL 13B

A proposal for an auto restricted zone (ARZ) and revised circulation patterns in downtown Boston is reported. In the City of Boston, the main problems are summarized as congestion, conflict of pedestrian and traffic, and confusion, rather than a lack of basic vitality. To remedy the current imbalance of pedestrian versus auto use, and to reduce the prevailing congestion in the older downtown traffic congestion was studied. The need to eliminate these problems, to create an appropriate environment for the existing or potential activities, and to improve connections among major activity areas are the basic factors for an Urban Design Plan. The goal for undertaking this proposed ARZ plan is to encourage the continued physical and economic revitalization of downtown Boston. GRA

N79-15851# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. TECHNICAL APPENDIX: BURLINGTON AUTO RESTRICTED ZONE STUDY Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 128 p Prepared in cooperation with Cambridge Systematics, Inc., Mass., Moore-Heder Architects, Cambridge, Mass. and Kearney (A. T.), Inc., Chicago, Ill.
(Contract DOT-TSC-1057)
(PB-286318/1; UMTA-VA-06-0042-78-6) Avail: NTIS HC A07/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B

A proposal for an auto restricted zone (ARZ) for the City of Burlington is examined. The City is faced with increased competition from a proposal for a major suburban shopping mall, as well as internal competition from a recently completed shopping arcade in the downtown area. This concern has culminated in the current proposal for construction of a 4-block pedestrian mall. A further issue facing the City is the quality of transit facilities in the downtown. Several of Burlington's earlier Urban Design Plans now comprise the main urban design components of the proposed ARZ plan. Four existing characteristics were assessed to test potential of an ARZ. The Urban Design Plan consists of two elements: a circulation framework and a street improvement program These elements are described in detail in the text. GRA

N79-15852# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. TECHNICAL APPENDIX: MEMPHIS AUTO RESTRICTED ZONE STUDY Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 184 p Prepared in cooperation with Cambridge Systematics, Inc., Mass., Moore-Heder Architects, Cambridge, Mass. and Kearney (A. T.), Inc., Chicago, Ill.
(Contract DOT-TSC-1057)
(PB-286319/9; UMTA-VA-06-0042-78-7) Avail: NTIS HC A09/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B

Analysis, data and supplementary information developed in the preparation of the Memphis auto restricted zone (ARZ) Demonstration Plan are presented. The approach taken in planning the circulation framework for the Memphis ARZ was somewhat different than that used in the other cities. Memphis had recently implemented a major change in its downtown circulation system by closing ten blocks and creating the Mid-America Mall. The Mall is active at midday during the week, but the evenings and weekends are quiet. Selective and modest additions could extend the Mall to a larger district, provide better facilities for the now disadvantaged transit riders, and encourage development projects that could improve street environment and support conversion of now-vacant buildings. GRA

N79-15853# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. TECHNICAL APPENDIX: PROVIDENCE AUTO RESTRICTED ZONE STUDY Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 207 p Prepared in cooperation with Cambridge Systematics, Inc., Mass., Moore-Heder Architects, Cambridge, Mass., and Kearney (A. T.), Inc., Chicago, Ill.
(Contract DOT-TSC-1057)
(PB-286320/7; UMTA-VA-06-0042-78-8) Avail: NTIS HC A10/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B

Technical analysis, data and supplementary information developed in the preparation of the Providence auto restricted zone (ARZ) demonstration plan are presented. Several existing urban design factors are critical to assess the potential for an ARZ in Providence: pedestrian environment; connections between downtown districts; quality of transit environment; historical quality and development potential; quality of economic environment; and management of public spaces. These issues are discussed in the text and the urban design proposals address these as problems that the ARZ should help resolve. GRA

N79-15854# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AUTO RESTRICTED ZONE/MULTI-USER VEHICLE SYSTEM STUDY. TECHNICAL APPENDIX: TUCSON AUTO RESTRICTED ZONE STUDY Final Report, Jul. 1975 - Dec. 1977
William S. Herald Dec. 1977 162 p Prepared in cooperation with Cambridge Systematics, Inc., Mass., Moore-Heder Architects, Cambridge, Mass., and Kearney (A. T.), Inc., Chicago, Ill.
(Contract DOT-TSC-1057)
(PB-286321/5; UMTA-VA-06-0042-78-9) Avail: NTIS HC A08/MF A01; also available in set of 9 reports HC E20 as PB-286312-SET CSCL 13B

A proposal for the preparation of an auto restricted zone (ARZ) in Tucson is examined. In order to revitalize the downtown, the City plans include reinforcement of the public transit system, construction of a major private office building and a public library, studies for rehabilitation of in-town historic residential neighborhoods, and attempts to attract new residential development downtown. GRA

N79-15863# Massachusetts Inst. of Tech., Cambridge. Center for Policy Alternatives.
GOVERNMENT INVOLVEMENT IN THE INNOVATION PROCESS: A CONTRACTOR'S REPORT TO THE OFFICE OF TECHNOLOGY ASSESSMENT
Aug. 1978 75 p refs Sponsored by Office of Technology Assessment
(PB-286545/9; OTA-R-73; LC-78-600102) Avail: NTIS HC A04/MF A01 CSCL 05A

The major factors that currently influence the process of introducing new goods and services to the user are examined. These factors include: incentives and funding for basic research; tax, patent, procurement, and antitrust policies; regulations; size, sector, and locale of the business; subsidies; inflation rate; available technical, marketing, and management skills; credit; and the formation of capital. The activities of five industrialized nations in the support of science and technology are described. GRA

N79-15866# Briscoe, Maphis, Murray and Lamont, Inc., Boulder, Colo.
ACTION HANDBOOK: MANAGING GROWTH IN THE SMALL COMMUNITY Final Report

James A. Murray and William Lamont, Jr. Jul. 1978 317 p refs
(Contract EPA-68-01-3579)
(PB-286911/3; EPA-908/4-78-005) Avail: NTIS HC A14/MF A01 CSCL 13B

An overview of the community management process is given to assist the user in estimating how development of a certain type might affect the community's needs for various public services. Approaches to getting the community involved and organized are described along with a working model for community organizers. Community action and growth management are discussed for those closely involved in making government work to manage growth. GRA

N79-15869# Comsis Corp., Wheaton, Md.
TRAVEL ESTIMATION PROCEDURES FOR QUICK RESPONSE TO URBAN POLICY ISSUES Final Report
Arthur B. Sosslau, Amin B. Hassam, M. M. Carter, and G. V. Wickstrom Washington Transportation Research Board. Jun. 1978 77 p refs Sponsored by Federal Highway Admin. and Am. Assoc. of State Highway and Transportation Officials
(PB-286889/1; TRB/NCHRP/REP-186; ISBN-0-309-02774-8; LC-78-66459) Avail: NTIS HC A05/MF A01 CSCL 13B

The most significant issues confronting urban transportation agencies that require travel demand information are described. The data requirements to meet those issues are identified, and available planning techniques that can provide the needed data are documented. These techniques, more than 40 in all, were fully evaluated in terms of input requirements, types of output, potential applications, and complexity. A system was developed to allow users to quickly locate the technique needed for their specific purpose. GRA

N79-15899# Naval Weapons Engineering Support Activity, Washington, D. C.
A PREDICTION OF AVIATION LOGISTICS REQUIREMENTS (PALR) FOR THE DECADE 1985-1995, VOLUME 1
Harry Foster Jun. 1978 100 p refs 2 Vol.
(AD-A060468) Avail: NTIS HC A05/MF A01 CSCL 15/5

The objectives of this study were to (1) develop a basis for forecasting naval aviation logistics requirements for the 1985-1995 decade, (2) identify problems inherent in the logistic support environment of naval aviation that will surface during this time-frame, and (3) make Navy leadership aware of the opportunities that exist in the future to alleviate the problems. Employing widely used technological forecasting techniques e.g. (expert opinions, delphi, scenarios, trend extrapolation, etc.) the study projected 8 to 18 years into the future. Thus, sufficient lead time is provided naval planners for developing efficient and effective systems to support the complex equipment and weapon systems of the near future. PALR has provided (1) a forum for industry and military experts to discuss the future of naval aviation (2) an awareness of existing trends that will exist unless remedies are taken. Author (GRA)

N79-15900# Naval Weapons Engineering Support Activity, Washington, D. C.
A PREDICTION OF AVIATION LOGISTICS REQUIREMENTS (PALR) FOR THE DECADE, VOLUME 2
Harry Foster Jun. 1978 166 p refs
(AD-A060488) Avail: NTIS HC A08/MF A01 CSCL 15/5

Trend and Event Methodology for the PALR Project is defined. In order to estimate the probability of the selected events, a questionnaire was developed. An impact analysis was conducted on the preliminary findings. Interviews for selected personnel were conducted to make improvements in the PALR Project. S.E.S.

N79-16151# Texas A&M Univ., College Station. Dept. of Industrial Engineering.
A USERS MANUAL FOR GEMS: A GENERALIZED MANUFACTURING SIMULATOR Progress Report, 1 Dec. 1977 - 1 Jun. 1978
Don T. Phillips, Mike Handwerker, and Pruchya Piumsomboon 1 Jun. 1978 138 p refs
(Grant NSF APR-76-22610)
(PB-287094/7; GEMS-7-78) Avail: NTIS HC A07/MF A01 CSCL 13H

The GEMS simulator currently consists of a small main program and 65 subroutine and function subprograms which interact to execute four phases of simulation; input, control, simulation, and output. The manual is divided into five sections: an overview of the GEMS program's organization and operation; data input variables and structure; examples; and warning and error messages. GRA

N79-16153# General Accounting Office, Washington, D. C. Community and Economic Development Div.
GETTING A BETTER UNDERSTANDING OF THE METRIC SYSTEM: IMPLICATIONS IF ADOPTED BY THE UNITED STATES, EXECUTIVE SUMMARY Report to the Congress.
20 Oct. 1978 90 p
(PB-287217/4; CED-78-128A) Avail: NTIS HC A05/MF A01 CSCL 05C

Whether the Nation's measurement system should be changed is a question still unresolved. GAO has looked into the subject of metrication--conversion to the metric system of measurement. The Congress, the Administration, the newly formed U.S. Metric Board, and in turn all Americans, are provided with a better understanding of the issues are provided. GRA

N79-16285 Nebraska Univ. - Lincoln.
ASSESSING SYSTEM AVAILABILITY USING THE GRAPHICAL EVALUATION AND REVIEW TECHNIQUE SIMULATION Ph.D. Thesis
Joseph Leon Sessum 1978 285 p
Avail: Univ. Microfilms Order No. 7900354

Methods of calculating and evaluating various quantitative effectiveness measures are explained. Specific emphasis is given to existing network modeling techniques. It was found that GERT, the graphical evaluation and review technique, and especially the simulation approach, GERTS, offers the greatest flexibility and utility for assessing and predicting the effectiveness measures. A tutorial approach is presented for the formulation and analysis of both stochastic (probabilistic) and deterministic system models. Single component system models and multiple component models for series, parallel, and complex system configurations are developed. The initial models rely on a predefined (a priori) maintainability parameter (mean time to repair), for the assessment of availability. A methodology for the assessment of a realistic maintainability parameter using GERTS is presented. Dissert. Abstr.

N79-16707 Pennsylvania Univ., Philadelphia.
A NORMATIVE MODEL OF R AND D PROJECT SELECTION UNDER UNCERTAINTY Ph.D. Thesis
Henry Ford 1978 286 p
Avail: Univ. Microfilms Order No. 7824719

A project selection and funding model is developed which incorporates the uncertainty of technical success and the uncertainty of commercial returns given technical success. It is assumed that the firm acts as a rational decision maker under uncertainty, that is, its behavior is consistent with the von Neumann-Morgenstern axioms. A budget-constrained funding model which characterizes potential project commercial interdependencies and consider the risk/time preferences of the firm in a multiperiod framework. Several modifications which improve the model's realism are discussed. An approach for incorporating projects' technical interdependencies within the model is shown. The time-table of projects' availabilities and deadlines can also be included so that the current outlay plan reflects the timing of future research. Dissert. Abstr.

N79-16708 Texas A&M Univ., College Station.
IMPLEMENTING A NEW STATISTICAL APPROACH TO PROJECT SCHEDULING Ph.D. Thesis
Thomas Cecil Baker, Jr. 1978 93 p
Avail: Univ. Microfilms Order No. 7900949

The project scheduling algorithm is a five step iterative procedure capable of determining a minimum cost project schedule when the activities making up the project have durations which are random variables. The cost of an activity is assumed to be a convex piecewise linear function of the activity's mean duration. The problem is to determine the activity mean durations which both minimize the total project cost and insure that the mean (or some specified percentile) of the corresponding project completion time distribution is less than or equal to a specified project deadline. The entire distribution of the project's completion time under the minimum cost schedule is a valuable by-product. Dissert. Abstr.

N79-16709*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A CRITICAL REVIEW OF THE LIFE SCIENCES PROJECT MANAGEMENT AT AMES RESEARCH CENTER FOR THE SPACELAB MISSION DEVELOPMENT TEST 3
Robert Helmreich (Texas Univ., Austin), John Wilhelm (Texas Univ., Austin), Trieve A. Tanner (California State Univ., Hayward), Joan E. Sieber (Texas Univ., Austin), and Susan Burgenbauch Jan. 1979 66 p refs
(Grant NsG-2065; NCA2-OR290-705)
(NASA-TP-1364; A-7536) Avail: NTIS HC A04/MF A01 CSCL 05A

A management study was initiated by ARC (Ames Research Center) to specify Spacelab Mission Development Test 3 activities and problems. This report documents the problems encountered and provides conclusions and recommendations to project management for current and future ARC life sciences projects. An executive summary of the conclusions and recommendations is provided. The report also addresses broader issues relevant to the conduct of future scientific missions under the constraints imposed by the space environment. G.Y.

N79-16710# Royal Naval Personnel Research Committee, London (England).
[SYNOPSIS OF THE ROLE OF THE RNPRC AND ITS ACTIVITIES COVERING THE PERIOD JANUARY 1975 TO DECEMBER 1976]
Dec. 1976 22 p
(RNP-1/77; BR61590) Avail: NTIS HC A02/MF A01

Investigations undertaken by the Royal Naval Research Committee to solve biological, medical, physiological, and psychological problems affecting the health and fighting efficiency of British naval personnel are reported. Areas studied included protective clothing for cold environments; deafness in divers; noise dosage of aircrews; the effects of carbon monoxide, carbon dioxide, and watchkeeping on submarine crews; survival at sea; physical fitness and operational efficiency under stresses; and underwater physiology. A list of published reports and related articles in scientific journals is included. A.R.H.

N79-16711# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
[RESEARCH ACTIVITIES] Annual Report, 1977
18 May 1978 207 p refs Original contains color illustrations
Avail: NTIS HC A10/MF A01

The history of the French national institute for aerospace research and studies (ONERA) is reviewed as well as its organizational structure and mission. Progress is reported in the application of mathematical methods to the study of systems in aerospace mechanics. Other areas of research discussed include fundamental and applied aerodynamics; aeroelasticity and fracture mechanics in structural analysis; compressors, turbines, solid and liquid propellant combustion, and ramjets; acoustics, optics, and electronics; solidified eutectics, heat resistant alloys, composite materials, and thermomechanical treatments; informatics; and special activities at the Toulouse Research Center (CERT). Patents filed and films completed in 1977 are described. Abstracts of published articles and technical notes are included along with the texts of news releases. A.R.H.

N79-16712# American Automatic Control Council, Wickliffe, Ohio.
RESEARCH NEEDS OF THE AUTOMATION FIELD
Samuel J. Dwyer, III and Theodore J. Williams Oct. 1977 256 p refs
(Grant NSF APR-76-01002)
(PB-286853/7; NSF/RA-770648) Avail: NTIS HC A12/MF A01 CSCL 05A

The Automation Research Council is in the process of expanding its list of recommendations, in both content and detail, concerning the research needs of the automation field for the next 20 years. Research, as outlined by the Council, is particularly needed in systems design and systems engineering. The following areas are discussed fully in this report: basic manufacturing systems architectures; data base design and operation; software-hardware interfaces between machines and between men and machines; fault tolerant, self repair, and self-diagnostic techniques; machine vision; and smart sensors. Recommendations are given for work to be done on the socio-economic and socio-technical aspects of the field, and on improving the educational institution's response to the needs of industry for trained personnel. GRA

N79-16722# Minnesota Univ., Minneapolis. Hubert H. Humphrey Inst. of Public Affairs.
DESIGN OF STATE, REGIONAL AND LOCAL DEVELOPMENT MANAGEMENT SYSTEMS, VOLUME 1
Robert C. Einsweiler, Robert H. Freilich, Michael E. Gleeson, and Martin Leitner Mar. 1978 392 p
(Grant NSF ENV-76-06857)
(PB-287324/8; NSF/RA-780285-Vol-1) Avail: NTIS HC A17/MF A01 CSCL 13B

Volume 1 of the study developed information on four critical gaps in development management systems: (1) statement of an enlarged concept of development management systems that could encompass efforts in growth and decline settings at all governmental levels; (2) identification of Federal and state government constraints on lower level governments; (3) identification of considerations in the selection of a system and techniques; and (4) decisions on how to monitor a system. The study addresses the ways of thinking about development management that are useful for design and policy making. The term development management is used to encompass the conscious public decision to restrain, accommodate or induce development in any geographic setting and at any governmental level. GRA

N79-16723# Minnesota Univ., Minneapolis. Hubert H. Humphrey Inst. of Public Affairs.
DESIGN OF STATE, REGIONAL AND LOCAL DEVELOPMENT MANAGEMENT SYSTEMS, VOLUME 2
Robert C. Einsweiler, Robert H. Freilich, Michael E. Gleeson, and Martin Leitner Mar. 1978 345 p
(Grant NSF ENV-76-06857)
(PB-287325/5; NSF/RA-780286-Vol-2) Avail: NTIS HC A15/MF A01 CSCL 13B

The study reviews the types of development management systems which were implemented in the cities treated as case studies in order to gain insight into the system gaps identified in Volume One and to apply ideas generated in the case studies. The earliest development management systems allocated land for development. An area of urbanization or an urban service area was established, bounded by an urban limit line. This approach is frequently the choice of counties or metropolitan agencies lacking direct land use or capital programming control. The next step in management, the support systems or budget approach, centered on the capital improvement program, addressing timing directly. The squeeze on public budgets was an additional factor in this choice. Another development management system aims to control the amount or rate of growth by housing unit allocation. A final type of management system, the activity allocation approach, is one that allocates activity, land and support services. GRA

N79-16738# JHK and Associates, Alexandria, Va.
APPLICATION OF UTCS FIRST GENERATION CONTROL SOFTWARE IN NEW ORLEANS
R. D. Henry, R. A. Ferlis, and R. M. White Nov. 1978 37 p Prepared jointly with Peat, Marwick, Mitchell and Co., Washington, D. C. 2 Vol.
(Contract DOT-FH-11-9286)
(PB-287359/4; FHWA-RD-78-2) Avail: NTIS HC A09/MF A01 CSCL 13B

An evaluation summary of the recently installed computer based traffic signal control system in New Orleans, Louisiana is presented. Emphasis was placed on the application of UTCS first generation software to control traffic on arterial roadways. The results showed that a time-of-day alternative resulted in an average of 8.8 percent reduction in total vehicle-minutes of network travel during the 14-hour testing period. A traffic responsive alternative provided an 8.5 percent reduction. GRA

N79-16795*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COST AND SCHEDULE MANAGEMENT ON THE QUIET SHORT-HAUL RESEARCH AIRCRAFT PROJECT
Darrell E. Wilcox and Peter Patterakis Jan. 1979 20 p refs
(NASA-TM-78547; A-7684) Avail: NTIS HC A02/MF A01 CSCL 02A

The Quiet Short-Haul Research Aircraft (QSRA) Project, one of the largest aeronautical programs undertaken by NASA to date, achieved a significant cost underrun. This is attributed to numerous factors, not the least of which were the contractual arrangement and the system of cost and schedule management employed by the contractor. This paper summarizes that system and the methods used for cost/performance measurement by the contractor and by the NASA project management. Recommendations are made for the use of some of these concepts in particular for future programs of a similar nature. Author

N79-16832# Federal Aviation Administration, Washington, D. C. System Research and Development Service.
ENGINEERING AND DEVELOPMENT PROGRAM PLAN: TERMINAL/TOWER CONTROL
Nov. 1978 93 p
(FAA-ED-14-2A) Avail: NTIS HC A05/MF A01

The engineering and development plan for FAA E&D Program 14, TERMINAL/TOWER CONTROL is documented. The relationship of Program 14 tc the overall E&D effort, the purpose, scope and direction of the program, and the major technical elements of the program are presented. The plan is intended to provide guidance to personnel charged with carrying out development activities under Program 14 and to provide a tool for the continuing management and control of these activities. The funds estimates required and for seeking approval of budgets are determined. S.E.S.

N79-16893# Department of Energy, Washington, D. C.
SATELLITE POWER SYSTEM (SPS) PROGRAM SUMMARY
Dec. 1978 116 p refs
(DOE/ER-0022) Avail: NTIS HC A06/MF A01

In April 1978, a Satellite Power System (SPS) Project office was established in the Office of Energy Research to manage all activities in this program area. The director of the project office focuses on SPS findings, prepares reports and provides recommendations to DOE management with regard to major and national decisions regarding future SPS development. Outlined in this annual Program Summary are: (1) fiscal year 1978 and 1979 summary tables; (2) systems definition studies; (3) environmental assessment studies; (4) societal assessment studies; and (5) comparative assessment studies. G.Y.

N79-16894*# Science Applications, Inc., Pleasanton, Calif.
SATELLITE POWER SYSTEM (SPS) FINANCIAL/MANAGEMENT SCENARIOS
J. Peter Vajk Oct. 1978 73 p refs Sponsored by NASA Prepared for PRC Energy Analysis Co., McLean, Va.
(Contract EG-77-C-01-4024)
(NASA-CR-158108; HCP/R-4024-03) Avail: NTIS HC A04/MF A01 CSCL 22A

The possible benefits of a Satellite Power System (SPS) program, both domestically and internationally, justify detailed and imaginative investigation of the issues involved in financing and managing such a large-scale program. In this study, ten possible methods of financing a SPS program are identified ranging from pure government agency to private corporations. The following were analyzed and evaluated: (1) capital requirements for SPS; (2) ownership and control; (3) management principles; (4) organizational forms for SPS; (5) criteria for evaluation; (6) detailed description and preliminary evaluation of alternatives; (7) phased approaches; and (8) comparative evaluation. Key issues and observations and recommendations for further study are also presented. G.Y.

N79-16903*# TRW Defense and Space Systems Group, Houston, Tex.
FORMULATION OF CONSUMABLES MANAGEMENT MODELS. VOLUME 1: MISSION PLANNING
J. G. Torian and M. A. Zamora Aug. 1978 26 p refs
(Contract NAS9-14264)
(NASA-CR-160098; TRW-26821-H024-R0-00) Avail: NTIS HC A03/MF A01 CSCL 22A

Development of an STS (Space Transportation System) interactive computer program MPP (Mission Planning Processor) working model was conducted. A summary of the computer program development and those supporting tasks conducted is presented. Development of the MPP Computer Program is discussed. This development was supported by several parallel tasks. These tasks either directly supported the program development, or provided information for future application and/or modification to the program in relation to the flight planning and flight operations of the STS and advanced spacecraft. The supporting tasks also included development of a Space Station MPP to demonstrate the applicability of the analytical methods developed under this RTOP to more advanced spacecraft than the STS. G.Y.

N79-16904*# TRW Defense and Space Systems Group, Houston, Tex.
FORMULATION OF CONSUMABLES MANAGEMENT MODELS. VOLUME 2: MISSION PLANNING PROCESSOR USER GUIDE
J. K. Daly and J. G. Torian Aug. 1978 46 p
(Contract NAS9-14264)
(NASA-CR-160097; TRW-26821-H024-R0-00) Avail: NTIS HC A03/MF A01 CSCL 22A

A user guide for the MPP (Mission Planning Processor) is presented. The MPP is used in the evaluation of particular missions, with appropriate display and storage of related consumables data. Design goals are accomplished by the use of an on-line/demand mode computer terminal Cathode Ray Tube Display. The process is such that the user merely adds specific mission/flight functions to a skeleton flight and/or alters the skeleton. The skeleton flight includes operational aspects from prelaunch through ground support equipment connect after rollout as required to place the STS (Space Transportation System) in a parking orbit, maintain the spacecraft and crew for the stated on-orbit period and return. G.Y.

N79-16905*# TRW Defense and Space Systems Group, Houston, Tex.
FORMULATION OF CONSUMABLES MANAGEMENT MODELS, EXECUTIVE SUMMARY
J. G. Torian Aug. 1978 17 p refs
(Contract NAS9-14264)
(NASA-CR-160099; TRW-26821-H023-R0-00) Avail: NTIS HC A02/MF A01 CSCL 22A

Future manned space programs that have increased launch frequencies and reusable systems require an implementation of new consumables and systems management techniques that

relieve both the operations support personnel and flight crew activities. Analytical models and techniques were developed which consist of a Mission Planning Processor (MPP) with appropriate consumables data base, methods of recognizing potential constraint violations in both the planning and flight operations functions, and flight data files for storage/retrieval of information over extended periods interfacing with flight operations processors for monitoring of the actual flights. Consumables subsystems considered in the MPP were electrical power, environmental control and life support, propulsion, hydraulics and auxiliary power. G.Y.

N79-17030 Council for Scientific and Industrial Research, Pretoria (South Africa).
SEMINAR ON THE SIMULATION OF INDUSTRIAL ENGINEERING SYSTEMS
1978 96 p refs Seminar held at Pretoria, 14 Mar. 1978
(S-162; ISBN-0-7988-1213-3) Avail: Issuing Activity

The utilization of simulation in industrial engineering is discussed. The topics covered are: (1) simulation as an optimization technique in the field of industrial engineering; (2) mathematical model of an electric smelting furnace; and (3) a quality assurance system.

N79-17056# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
AN ANALYSIS OF FIRE INCIDENTS IN MILITARY AIRCRAFT HANGERS: THE COMPUTERIZED DATA BASE, AN EFFECTIVE TOOL M.S. Thesis
James F. Kennedy and David R. Thomas Sep. 1978 77 p refs
(AD-A061334; AFIT-LSSR-17-78B) Avail: NTIS HC A05/MF A01 CSCL 13/12

This thesis analyzes an existing United States Navy computerized data base of fire incidents in aircraft hangars to demonstrate the usefulness of such a data base as a management tool and also the need for a similar data base in the United States Air Force. The analysis is accomplished using the Statistical Package for Social Sciences (SPSS) program to perform frequency, crosstabulation and breakdown operations on the data base. The authors concluded that the effective assessment of fire loss potential and the justification of existing or proposed fire protection policy could be greatly enhanced by information on the frequency, causes, and behavior of historical fire incidents.
Author (GRA)

N79-17405# World Meteorological Organization, Geneva (Switzerland). International Council of Scientific Unions.
FOURTEENTH SESSION OF THE JOINT ORGANIZING COMMITTEE Global Atmospheric Research Programme
1978 203 p Conf. held at Mexico City, 13-19 Apr. 1978
Avail: NTIS HC A10/MF A01; WMO, Geneva Sw. Fr. 40

The following topics are discussed: (1) Joint Organizing Committee activities; (2) the global experiment; (3) the climate dynamics subprogram; (4) the working group on numerical experimentation; (5) other GARP subprograms; and (6) organization of future work. G.Y.

N79-17475*# Massachusetts Inst. of Tech., Cambridge.
PROCEEDINGS, 13TH ANNUAL CONFERENCE ON MANUAL CONTROL
1977 470 p refs Conf. held at Cambridge, Mass., 15 - 17 Jun. 1977; sponsored by NASA and DOT
(NASA-CR-158107) Avail: NTIS HC A20/MF A01 CSCL 05H

Theoretical aspects of manual control theory are discussed. Specific topics covered include: tracking; performance, attention allocation, and mental load; surface vehicle control; monitoring behavior and supervisory control; manipulators and prosthetics; aerospace vehicle control; motion and visual cues; and displays and controls.

N79-17494*# Massachusetts Inst. of Tech., Cambridge.
MODELING HUMAN DECISION MAKING BEHAVIOR IN SUPERVISORY CONTROL
M. K. Tulga and T. B. Sheridan *In its* Proc., 13th Ann. Conf. on Manual Control 1977 p 199-209 refs

(Grant NsG-2118)
Avail: NTIS HC A20/MF A01 CSCL 09B

An optimal decision control model was developed, which is based primarily on a dynamic programming algorithm which looks at all the available task possibilities, charts an optimal trajectory, and commits itself to do the first step (i.e., follow the optimal trajectory during the next time period), and then iterates the calculation. A Bayesian estimator was included which estimates the tasks which might occur in the immediate future and provides this information to the dynamic programming routine. Preliminary trials comparing the human subject's performance to that of the optimal model show a great similarity, but indicate that the human skips certain movements which require quick change in strategy. J.M.S.

N79-17495*# Technische Hogeschool, Delft (Netherlands). Man-Machine Systems Group.
A MODEL OF THE HUMAN SUPERVISOR
Jan J. Kok and Ron A. vanWijk *In* MIT Proc., 13th Ann. Conf. on Manual Control 1977 p 210-216 refs

Avail: NTIS HC A20/MF A01 CSCL 05J

A general model of the human supervisor's behavior is given. Submechanisms of the model include: the observer/reconstructor; decision-making; and controller. A set of hypothesis is postulated for the relations between the task variables and the parameters of the different submechanisms of the model. Verification of the model hypotheses is considered using variations in the task variables. An approach is suggested for the identification of the model parameters which makes use of a multidimensional error criterion. Each of the elements of this multidimensional criterion corresponds to a certain aspect of the supervisor's behavior, and is directly related to a particular part of the model and its parameters. This approach offers good possibilities for an efficient parameter adjustment procedure. J.M.S.

N79-17500*# Foxboro Co., Mass.
INTERFACE DESIGN IN THE PROCESS INDUSTRIES
M. C. Beaverstock, H. G. Stassen (Technische Hogeschool, Delft, Netherlands), and R. A. Williamson *In* MIT Proc., 13th Ann. Conf. on Manual Control 1977 p 258-265 refs

Avail: NTIS HC A20/MF A01 CSCL 05A

Every operator runs his plant in accord with his own mental model of the process. In this sense, one characteristic of an ideal man-machine interface is that it be in harmony with that model. With this theme in mind, the paper first reviews the functions of the process operator and compares them with human operators involved in control situations previously studied outside the industrial environment (pilots, air traffic controllers, helmsmen, etc.). A brief history of the operator interface in the process industry and the traditional methodology employed in its design is then presented. Finally, a much more fundamental approach utilizing a model definition of the human operator's behavior is presented. L.S.

N79-17539# Institute for Perception RVO-TNO, Soesterberg (Netherlands).
SUNGLASSES FOR DRIVERS?
J. J. Vos 1977 11 p ref In DUTCH; ENGLISH summary
(Contract A77/K/021)
(IZF-1977-24; TDCK-70263) Avail: NTIS HC A02/MF A01

After surveying the need for sunglasses, of tractor drivers in particular, two questions were considered: (1) Are sunglasses beneficial to performance? and (2) Can examples be given of procurement of sunglasses by employers? The answer to both questions was affirmative. It is concluded that central procurement to qualified personnel can be considered as appropriate practice. Requirements were formulated, both for sunglasses and for potential recipients. J.M.S.

N79-17590# Pacifica Technology, Del Mar, Calif.
THE INTERAGENCY SOFTWARE EVALUATION GROUP: A CRITICAL STRUCTURAL MECHANICS SOFTWARE EVALUATION CONCEPT
Robert Nickell Aug. 1978 20 p refs
(Contract N00014-77-C-0575)
(AD-A061468; PT-U78-0246) Avail: NTIS HC A02/MF A01 CSCL 09/2

The Interagency Software Evaluation Group, composed of representatives from various United States government research and development agencies, including the Army, Navy, Air Force, the National Science Foundation, the Department of Energy, and the Nuclear Regulatory Commission, have initiated an effort aimed at the critical evaluation of applications computer software. With active participation from the three armed services, a list of such applications software in the field of structural mechanics has been derived and screened. The screening criteria were based upon actual or potential use in a multi-laboratory or multi-agency environment. In addition, software selected for further evaluation was required to meet minimum requirements with respect to availability, documentation, and verification. The codes deemed to most typify these conditions were NASTRAN, ADINA, STAGS, and SAP. A family of shell-of-revolution codes was also selected for further study. Critical evaluation criteria are discussed in detail. Author (GRA)

N79-17600# National Technical Information Service, Springfield, Va.
A DIRECTORY OF COMPUTER SOFTWARE APPLICATIONS: ADMINISTRATION AND MANAGEMENT Progress Report, 1970 - Jul. 1978
Aug. 1978 107 p
(PB-283714/4; NTIS/SA-78/12) Avail: NTIS HC $28.00/MF $28.00 CSCL 09B

Administration and management list of computer programs and/or their documentation are cited. These software applications pertain to topics such as personnel management, inventory management, urban planning, logistics, management information systems, and program planning and control. The directory contains complete bibliographic data as well as a subject and a corporate author index. GRA

N79-17604# Michigan Univ., Ann Arbor. Dept. of Industrial and Operations Engineering.
SOME PROBLEMS OF QUEUES WITH FEEDBACK
Ralph L. Disney and Gilles R. dAvignon Nov. 1978 46 p refs Prepared in cooperation with Virginia Polytechnic Inst. and State Univ., Blacksburg
(Contracts N00014-75-C-0492; N00014-67-A-0181; NR Proj. 364-071; NR Proj. 042-296; NR Proj. 042-292)
(AD-A061102; VTR-78-2) Avail: NTIS HC A03/MF A01 CSCL 12/1

Queueing systems, which include the possibility for a customer to return to the same server for additional service, are called queueing systems with feedback. Such systems occur in computer networks, production networks, street traffic networks, neural networks, and the like. In spite of these potential applications, the study of such systems within the field of queueing theory is almost absent. This paper presents a few results for a broad class of queues with instantaneous feedback. Of particular interest here are queues with Markov renewal arrival processes, service times dependent on customer types and feedback mechanisms depending on queue length increments, service times, customer types and previous histories of the feedback mechanism. It will be shown that networks as simple as Jackson networks with one server can present some formidable and unsolved problems. Special attention will be placed on these unsolved problems and new areas of queueing theory in need of research. GRA

N79-17724# Princeton Univ., N. J. Aerospace Systems Lab.
RESEARCH ON THE PROBLEM OF EFFICIENT R AND T PROGRAM FORMULATION UNDER CONDITIONS OF UNCERTAINTY AND RISK Final Report, 1 May 1975 - 30 Apr. 1976
J. S. Greenberg and G. A. Hazelrigg, Jr. 13 Mar. 1978 263 p refs
(Grant NsG-7131)
(NASA-CR-158115; AMS-1268) Avail: NTIS HC A12/MF A01 CSCL 05A

The research that was performed and is reported has placed emphasis on the development of a methodology and implementation of supporting computer programs which will lead to more efficient R&T program formulation. The methodology is aimed at determining the mix of R&T projects that maximizes the decision maker value function under multiple budgetary constraints stated as functions of time. The value function considers multiple project attributes, the relative importance of these attributes to the decision maker distribution of funds and the temporal distribution of costs and benefits of multiple R&T projects. The research was also concerned with determining the attributes of significance for OAST R&T program formulation and the development of a methodology for establishing the relative importance of these attributes. G.Y.

N79-17725# IIT Research Inst., Annapolis, Md.
FEDERAL AVIATION ADMINISTRATION FLIGHT SERVICE STATION EMERGENCY SERVICES PROGRAM Final Report
Franklin Atwell Aug. 1978 35 p ref Prepared for Electromagnetic Compatibility Analysis Center
(Contracts DOT-FA70WAI-175; F19628-78-C-0006; AF Proj. 649E)
(ECAC-PR-78-043; FAA-RD-78-140) Avail: NTIS HC A03/MF A01

Program, formats and outputs are described that were developed and produced by ECAC for the Federal Aviation Administration. These programs can be used to describe the existing LOS coverage area of FAA direction-finding stations, airport surveillance radars, and air route surveillance radars, in the conterminous United States. L.S.

N79-17726# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
IDENTIFICATION AND DEFINITION OF THE MANAGEMENT COST ELEMENTS FOR CONTRACTOR FURNISHED EQUIPMENT AND GOVERNMENT FURNISHED EQUIPMENT M.S. Thesis
Billy D. Dillard and Philip D. Inscoe Sep. 1978 135 p refs
(AD-A061300; AFIT-LSSR-22-78B) Avail: NTIS HC A07/MF A01 CSCL 15/5

ASPR requires that the program manager perform a cost analysis to determine which components should be procured as GFE instead of being purchased from the prime contractor as CFE. Many cost factors contribute to the decision to provide an item as CFE or GFE. One cost that must be considered is the cost of managing the item, which includes, for example, personnel costs and government and contractor overhead costs. The authors have identified, defined, and assessed the use of relevant and practical elements of contractor and government management cost that should be considered in the CFE/GFE selection process. The study shows that the cost elements are considered important, but not frequently considered, and generally management cost analysis is inadequate. Author (GRA)

N79-17727# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A TEST TO EVALUATE A PROPOSED AIR FORCE LOGISTICS COMMAND INDICATOR OF CONTRACTOR PERFORMANCE M.S. Thesis
James D. Schuman and James Vitelli Sep. 1978 97 p refs
(AD-A061301; AFIT-LSSR-25-78B) Avail: NTIS HC A05/MF A01 CSCL 15/5

The purpose of this research effort was to test and evaluate a proposed Management Information System indicator. The indicator was proposed by the Air Force Logistics Command for use of contractor performance. This research includes: (1) the plan for the overall evaluation, (2) the tests to assure validity of the input data, and (3) procedures, criteria, and recommendation for selection of the proposed indicator. The proposed indicator

of contractor delivery performance was tested for relevance by comparing it to the existing measurement of delivery delinquencies. In the course of the research, it was discovered that the new indicator would provide little additional information of use to managers. Additionally, it was found that Purchase Request need dates may not be true indicators of the needs of the Air Force; that contractors tend to deliver on their own schedules, regardless of contract requirements; and that post-award contractual action by the Government appear to be ineffective. Author (GRA)

N79-17728# Defense Logistics Analysis Office, Alexandria, Va.
THE SHELF-LIFE ITEM MANAGEMENT PROGRAM
Sep. 1978 69 p
(AD-A061326) Avail: NTIS HC A04/MF A01 CSCL 15/5

In January 1978, the Defense Logistics Analysis Office (DLAO) was given a study assignment to ascertain an appropriate method for monitoring and evaluating the effectiveness of the Department of Defense (DoD) Shelf-Life Item Management Program. In making this study assignment, the Office of the Secretary of Defense advised that the conclusions and recommendations of the study must recognize the constraints of the Deputy Secretary of Defense Memorandum dated May 19, 1977, 'Moratorium on the Establishment of DoD Information Collection and Processing Systems and Data Bases.' The research, data accumulation, and analyses aimed at the development of a DoD Shelf-Life Item Management Program evaluation system were completed in July 1978. This report contains the findings, analyses, conclusions, and recommendations of the Study. GRA

N79-17729# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
AIR FORCE ACQUISITION LOGISTICS DIVISION, ITS CREATION AND ROLE M.S. Thesis
Clarke W. Powers and Thomas J. Recktenwalt Sep. 1978 151 p refs
(AD-A061357; AFIT-LSSR-32-78B) Avail: NTIS HC A08/MF A01 CSCL 05/1

This thesis is a study of the Air Force Acquisition Logistics Division (AFALD) and how it fits into the acquisition community. The accomplishments of AFALD are examined against its objectives of influencing logistics supportability early in the acquisition process and providing a smooth transition of management responsibility from AFSC to AFLC at PMRT. To accomplish this, the thesis begins with a discussion of the acquisition process and a chronological development of the acquisition philosophy and structure from the Army Signal Corps in 1917 to the creation of AFALD. Then AFALD, along with its deputates, are examined as to mission and structure for interface into the acquisition community. Accomplishments of AFALD are then compared to AFALD's stated mission and objectives. Finally, several questions concerning lines of authority and responsibility are raised about the various organizations involved in the acquisition process. Author (GRA)

N79-17730# Naval Postgraduate School, Monterey, Calif.
AN ANALYSIS OF PROPOSED CONTRACTOR PROVISIONING OF THE F-18 AIRCRAFT M.S. Thesis
Kenneth H. Rasmussen Sep. 1978 136 p refs
(AD-A061018) Avail: NTIS HC A07/MF A01 CSCL 01/3

The initial provisioning of the F-18 aircraft by the prime contractor in lieu of by the Aviation Supply Office, Philadelphia, Pa., has been proposed. This thesis provides an analysis of the Provisioning Requirements Statement (PRS) prepared to contractually obligate the prime contractor to perform the provisioning. Externalities affecting the move towards contractor provisioning are discussed. The provisioning of the F-18 by the contractor is concurred within principle, but it is recommended that the PRS be reviewed to ensure clarity and full understanding of specific PRS paragraphs as identified in the analysis. Author (GRA)

N79-17731# Naval Postgraduate School, Monterey, Calif.
MANAGEMENT CONTROL IN WEAPONS SYSTEMS ACQUISITION M.S. Thesis
Joseph P. Losquadro Sep. 1978 132 p refs
(AD-A061276) Avail: NTIS HC A07/MF A01 CSCL 05/1

This thesis examines the management function from the perspective of a Navy Weapons Acquisition Program Manager. It is hypothesized that control is a key variable to success. To be in control, a program manager must make significant decisions in the process of fulfilling his basic mission. To be effective, those decisions must be informed decisions. The first half of this thesis effort establishes a conceptual base for the subsequent development of a practical framework for management control in an ongoing acquisition project. Chapters two and three report the results of an analysis of the literature on control and information management. The conceptual study concludes with an examination of two theoretical frameworks, a brief look at the Navy program manager and how he fits into these two frameworks, followed by a summary description of three control systems used in the Navy today. The second half of the effort presents a proposal for a management control system for the FIREBRAND Missile acquisition project, and a model for future efforts in similar circumstances. Author (GRA)

N79-17732# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A CONCEPTUAL STUDY OF THE USAF AIRCRAFT ENGINE ACQUISITION AND SUPPORT MANAGEMENT SYSTEM M.S. Thesis
Ronald E. Fisher and Alex Sanchez Sep. 1978 96 p refs
(AD-A061288; AFIT-LSSR-14-78B) Avail: NTIS HC A05/MF A01 CSCL 21/5

The acquisition and logistics support of USAF propulsion engines has been studied extensively. The Procurement Management Review (PMR), completed in 1976, is the latest and most comprehensive review of this subject. The PMR recommended the creation of an Air Staff organization which would serve as a focal point for and provide overall policy direction on propulsion engines. This research set out to determine if such a proposed organization would resolve some of the fundamental problems found within the engine acquisition and support management system. A management cybernetic model was used to study the engine 'system' and to answer the research question. The authors concluded that the proposed organization would be inconsistent with the requirements of the model, and therefore, would not resolve the engine system's fundamental problems. This research found that the principal problem of the engine system was the fractionalization of its management organization resulting from a deficient management information system. Author (GRA)

N79-17733# National Technical Information Service, Springfield, Va.
RESEARCH MANAGEMENT, VOLUME 1. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1971 - 1977
Mary E. Young Dec. 1978 271 p refs 2 Vol.
(NTIS/PS-78/1308/2) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

Theory and practice of the management of research are described in the reports cited, including modeling techniques, such as practical applications in financing, personnel, and program allocation and critiques of existing practices. Reports covering primarily innovation, assessment, and annual reports of individual organizations are excluded. This updated bibliography contains 266 abstracts, none of which are new entries to the previous edition. GRA

N79-17734# National Technical Information Service, Springfield, Va.
RESEARCH MANAGEMENT, VOLUME 2. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, Jan. - Dec. 1978
Mary E. Young Dec. 1978 97 p Supersedes NTIS/PS-77/1166; NTIS/PS-76/1022 2 Vol.
(NTIS/PS-78/1309/0; NTIS/PS-77/1166; NTIS/PS-76/1022) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

This bibliography cites 92 reports relating to research management and its practical applications. Aspects covered include financing, personnel management, and program allocation. All entries are new to the previous edition. GRA

N79-17735# Kentucky Dept. for Local Government, Frankfort.
MANAGEMENT BY OBJECTIVES AND RESULTS, INSTRUCTORS GUIDE Final Report
Junie M. Tutterow Aug. 1978 38 p
(PB-287402/2; KY/DLG/MTEP-78/4; Rept-602-FR) Avail: NTIS HC A03/MF A01 CSCL 05A

Municipal managers seeking to improve their organizational performance can benefit from management by objectives and results. Materials for the orderly presentation of this program as well as a time schedule for its implementation over a six month period are suggested or supplied. GRA

N79-17736# Texas A&M Univ., College Station. Dept. of Industrial Engineering.
GENERALIZED MANUFACTURING SIMULATOR (GEMS), A MANAGEMENT PERSPECTIVE AND EXAMPLES
Rodney J. Heisterberg, Don T. Phillips, Vijay K. Dharia, and Sathaye Shashikant 1 Jun. 1978 104 p refs
(Grant NSF APR-76-22610)
(PB-287430/3; GEMS-6-78) Avail: NTIS HC A06/MF A01 CSCL 13H

Progress in the application of the Generalized Manufacturing Simulator (GEMS) to factory and warehouse management problems is described. The use of simulation and associated management perspectives is also presented. GEMS modeling concepts are discussed in terms of the modular and hierarchical nature of the simulation language. The impact of material handling on manufacturing logistics problems provides a framework for discussion of fundamental GEMS material flow network models. Examples of using GEMS to study the operation of mobile vehicles, conveyors, and cranes are described. A complete simulation case study of an example factory illustrates the use of GEMS. GRA

N79-17739# National Technical Information Service, Springfield, Va.
LIBRARY MANAGEMENT. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Nov. 1978
Carolyn A. Shonyo Dec. 1978 264 p Supersedes NTIS/PS-77/1159; NTIS/PS-76/1037; NTIS/PS-75/873
(NTIS/PS-78/1317/3; NTIS/PS-77/1159; NTIS/PS-76/1037; NTIS/PS-75/873) Avail: NTIS HC $28.00/MF $28.00 CSCL 05B

The cited references include reports on management of library operations and personnel. Specific topics covered are: management of acquisition and processing of library holdings, management planning of programs and activities, operations analysis, economic analysis, community library services and needs, planning of libraries in various regions, library personnel management, and training. This updated bibliography contains 257 abstracts, 43 of which are new entries to the previous edition. GRA

N79-17741# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
A STUDY OF THE APPROPRIATIONS OF COSTS IN INPE [UMA ABORDAGEM PARA APROPRIACAO DE CUSTOS]
Jose Liberato, Jr., Luiz Dalmir F. DeCampos, and Oscar Pereira Dias, Jr. Feb. 1978 61 p In PORTUGUESE
(INPE-1192-NTE/112) Avail: NTIS HC A04/MF A01

An approach is presented to the problem of cost appropriations in INPE. For the expenditures, the nature, time and place of occurrence, and end items are considered. Transl. by F.O.S.

N79-17744# National Bureau of Standards, Washington, D. C. Building Economics and Regulatory Technology Div.
LIFE-CYCLE COSTING. A GUIDE FOR SELECTING ENERGY CONSERVATION PROJECTS FOR PUBLIC BUILDINGS Final Report
Rosalie T. Ruegg, John S. McConnaughey, G. Thomas Sav, and Kimberly A. Hockenbery Sep. 1978 84 p refs Sponsored in part by DOE
(PB-287804/9; NBS-BSS-113) Avail: NTIS HC A05/MF A01 CSCL 05C

A step-by-step guide is presented for using life-cycle costing analysis to evaluate and rank the cost effectiveness of alternative energy conservation retrofit projects to existing public buildings; and to select the most cost-effective design for new buildings. Worksheets, illustrated with a realistic example, and a computer program are provided. This guide is compatible with a life-cycle costing guide prepared for the Department of Energy for use in the Federal Energy Management Program by Federal Agencies and is intended as an aid to state and local governments for use in their energy conservation programs. GRA

N79-17745# Committee on Commerce, Science, and Transportation (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1980, PART 1
Washington GPO 1979 803 p Hearings on S. 357 before the Comm. on Commerce, Sci., and Transportation, 96th Congr., 1st Sess., 1979
(GPO-38-973) Avail: Comm. on Commerce, Sci., and Transportation

Budget plans for NASA research and development, construction of facilities, research and program management, and other purposes are presented. Requests for appropriations are justified according to programs and activities at the various centers. A.R.H.

N79-17757# Chakrabarti (Alok K.) and Associates, Wallingford, Pa.
A REVIEW OF CRITICAL FACTORS AFFECTING TECHNOLOGICAL INNOVATION AND SOME POLICY IMPLICATIONS
Alok K. Chakrabarti and William E. Souder May 1978 14 p refs Sponsored by Commerce Dept.
(PB-287833/8) Avail: NTIS HC A02/MF A01 CSCL 05A

Those factors which were reported to be critically important in the technological innovation process are reported. The innovation process is described as a stage-wise process and the important factors for each stage are identified. A description is given of how Federal policies and regulations can affect this stage-wise process. Several policy/regulatory programs that are designed to influence innovative efforts in various countries are identified. The report contains several policy recommendations from studies conducted in the U.S. and presents these for consideration by the National Center; indicates several leverage points for private and public policy actions within the complex system of the innovation process. It emphasizes that some parts of nonmissionoriented research cannot be programmed or planned in advance and that to effectively utilize policy prescriptions the implementer must be fully aware of the environmental, contextual system, as well as of the innovation-factors system. GRA

N79-17822*# Lockheed-Georgia Co., Marietta.
CARGO/LOGISTICS AIRLIFT SYSTEM STUDY (CLASS), VOLUME 1
J. M. Norman, R. D. Henderson, F. C. Macey, and R. P Tuttle Hampton, Va. NASA Nov. 1978 338 p
(Contract NAS1-14967)
(NASA-CR-158915; LG78ER0266-Vol-1) Avail: NTIS HC A15/MF A01 CSCL 01C

Current and advanced air cargo systems are evaluated using industrial and consumer statistics. Market and commodity characteristics that influence the use of the air mode are discussed along with a comparison of air and surface mode on typical routes. Results of on-site surveys of cargo processing facilities at airports are presented, and institutional controls and influences on air cargo operations are considered. F.O.S.

N79-17823*# Lockheed-Georgia Co., Marietta.
CARGO/LOGISTICS AIRLIFT SYSTEM STUDY (CLASS), VOLUME 2
J. M. Norman, R. D. Henderson, F. C. Macey, and R. P. Tuttle Hampton, Va. NASA Nov. 1978 334 p refs
(Contract NAS1-14967)
(NASA-CR-158916; LG78ER0267-Vol-2) Avail: NTIS HC A15/MF A01 CSCL 01C

Air containerization is discussed in terms of lower freight rates, size and pallet limitations, refrigeration, backhaul of empties, and ownership. It is concluded that there is a need for an advance air cargo system as indicated by the industry/transportation case studies, and a stimulation of the air cargo would result in freight rate reductions. F.O.S.

N79-17824*# Lockheed-Georgia Co., Marietta.
CARGO/LOGISTICS AIRLIFT SYSTEM STUDY (CLASS), EXECUTIVE SUMMARY
J. M. Norman, R. D. Henderson, F. C. Macey, and R. P. Tuttle Hampton, Va. NASA Nov. 1978 37 p
(Contract NAS1-14967)
(NASA-CR-158959; LG78ER0265) Avail: NTIS HC A03/MF A01 CSCL 01C

The current air cargo system is analyzed along with advanced air cargo systems studies. A forecast of advanced air cargo system demand is presented with cost estimates. It is concluded that there is a need for a dedicated advance air cargo system, and with application of advanced technology, reductions of 45% in air freight rates may be achieved. F.O.S.

N79-17853*# Boeing Commercial Airplane Co., Seattle, Wash.
DEVELOPMENT OF INTEGRATED PROGRAMS FOR AEROSPACE-VEHICLE DESIGN (IPAD): PRODUCT PROGRAM MANAGEMENT SYSTEMS Final Report
J. M. Isenberg and J. W. Southall Mar. 1979 89 p
(Contract NAS1-14700)
(NASA-CR-2983; D6-IPAD-70035-D) Avail: NTIS HC A05/MF A01 CSCL 01C

The Integrated Programs for Aerospace Vehicle Design (IPAD) is a computing system to support company-wide design information processing. This document presents a brief description of the management system used to direct and control a product-oriented program. This document, together with the reference design process (CR 2981) and the manufacture interactions with the design process (CR 2982), comprises the reference information that forms the basis for specifying IPAD system requirements. L.S.

N79-18331 British Library Lending Div., Boston Spa (England).
COMBINED QUALITY-CONTROL SYSTEM AT THE MAGNITOGORSK COMBINE
M. F. Kochnev and G. A. Baryshen 20 Mar. 1978 17 p Transl. into ENGLISH from Stal (USSR), no. 9, 1977 p 841-844
(BLLD-M-25630-(5828.4F)) Avail: British Library Lending Div., Boston Spa, Engl.

The quality-control system developed at the combine is directed to the perfecting of the technological processes. The basis of the system is a constant link with production, between sub-divisions and with users, a quick reaction to a change in raw materials, materials, technology, the state of plants, machinery and units, production supplies, monitoring and mutual monitoring and timely information. The application of the system at the combine has enabled product quality and production efficiency to be raised. Author

N79-18660 Louisiana State Univ. and A&M Coll., Baton Rouge.
THE INSENSITIVITY OF LEONTIEF MULTIPLIERS TO RANDOM INPUT-OUTPUT MATRICES WITH FIXED COLUMN SUMS Ph.D. Thesis
Joseph Lorne Katz 1978 71 p
Avail: Univ. Microfilms Order No. 7903138

Input-output analysis provided a technique to examine the interrelationships within an economic system. Although input-output analysis was originally developed by Wassily Leontief to measure intersectorial activity in the whole American economy, this technique was applied to the study of economic activity within cities, states, and regions. The capability of input-output analysis to completely account for the complex interactions among industries makes it useful as an aid in economic planning and development for both industry and government. One of the most useful measures that was obtained from input-output analysis was the Leontief multiplier. These multipliers, computed from a matrix of technical coefficients, evaluate the economic effects of each industry on the regional or national economy. While multipliers have many applications, the determination of multipliers through the use of input-output analysis required a considerable amount of time and effort. Dissert. Abstr.

N79-18797* National Aeronautics and Space Administration, Washington, D. C.
NASA'S UNIVERSITY PROGRAM: ACTIVE GRANTS AND RESEARCH CONTRACTS, FISCAL YEAR 1978
1978 339 p
(NASA-TM-80037) Avail: NTIS HC A15 CSCL 05B

As basic policy NASA believes that colleges and universities should be encouraged to participate in the space and aeronautics program to the maximum extent practicable. The NASA objective is to have them bring their scientific, engineering, and social research competence to bear on aerospace problems and on the broader social, economic, and international implications of NASA technical and scientific programs. This annual report is one means of documenting the NASA-university relationship, frequently denoted, collectively, as NASA University Program. G.Y.

N79-18798 Colorado State Univ., Fort Collins.
MANAGEMENT FOR INTERDISCIPLINARY EFFECTIVENESS IN RESEARCH Ph.D. Thesis
Donald Charles Taylor 1978 615 p
Avail: Univ. Microfilms Order No. 7901895

The purposes of this dissertation are to: (1) describe and discuss management characteristics of successful interdisciplinary research projects which can potentially influence the interdisciplinary effectiveness of the research; (2) describe and discuss interdisciplinary effectiveness of research and criteria by which it can be measured; (3) describe and discuss methods and techniques for the measurement of interdisciplinary effectiveness and interdisciplinary research management characteristics; and (4) describe the relationships between interdisciplinary effectiveness and interdisciplinary project management. Results of the research show that there are unique qualities and techniques of management that influence how interdisciplinary teams can be more effective. These qualities are measureable and quantifiable as is the effectiveness of the final product. The final product has two qualities. One is how effective the work has been and the other is how much it reflects the inputs of interdisciplinary operation and organization. Dissert. Abstr.

N79-18799# Federal Aviation Administration, Washington, D. C.
HELICOPTER OPERATIONS DEVELOPMENT PLAN
Sep. 1978 116 p
(FAA-RD-78-101; PAR-517-78) Avail: NTIS HC A06/MF A01

The Helicopter Operations Development Plan is designed to provide for upgrading and development of all those criteria, standards, procedures, systems, and regulatory activities which will allow safe, timely and economical integration of the helicopter into all-weather operations in the National Airspace System. It describes a five-year development program whose objective is to improve the National Airspace System so as to enable helicopters to employ their unique capabilities. These areas are covered in the plan: (1) IFR Helicopter Operations; (2) Navigation Systems Development; (3) Communication Systems Development; (4) Helicopter Air-Traffic Control; (5) Weather Environment; (6) All-Weather Heliport Development; (7) IFR Helicopter Certification Standards; (8) Helicopter Icing Standards; (9) Helicopter Crashworthiness and (10) Helicopter Noise

Characterization. The FAA groups, other Federal Government agencies and other organizations participating in this effort are identified. Program management responsibilities are addressed. A program schedule with milestones is presented and program funding requirements are identified. L.S.

N79-18800*# Mitre Corp., Houston, Tex.
JSC INTERACTIVE BASIC ACCOUNTING SYSTEM
J. F. Spitzer Sep. 1978 59 p refs
(NASA Order T-5259-F; Contract F19628-78-C-0001; AF Proj. 8470)
(NASA-CR-160107; MTR-4718; JSC-14481) Avail: NTIS HC A04/MF A01 CSCL 05A

Design concepts for an interactive basic accounting system (IBAS) are considered in terms of selecting the design option which provides the best response at the lowest cost. Modeling the IBAS workload and applying this workload to a U1108 EXEC 8 based system using both a simulation model and the real system is discussed. J.M.S.

N79-18801# Civil Aeromedical Inst., Oklahoma City, Okla.
AN EVALUATION OF FOUR MTS RECURRENT TRAINING COURSES
Roger C. Smith Sep. 1978 105 p
(FAA-AM-78-32) Avail: NTIS HC A06/MF A01

The effectiveness of four recurrent training courses at the Federal Aviation Administration Management Training School (MTS) were assessed. The courses evaluated were: (1) Performance Improvement and Employee Appraisal; (2) Labor Relations for Management; (3) Constructive Discipline; and (4) Managerial Effectiveness. Questionnaires concerning the usefulness of course content, effects on supervisor behavior, and impact on the organizational unit were sent to randomly selected graduates of these courses. Behavioral ratings by graduates, their immediate superiors, and supervisors generally supported the conclusion that these courses had a beneficial impact on supervisory behavior. G.Y.

N79-18802# Defense Systems Management School, Fort Belvoir, Va.
DEFENSE SYSTEMS MANAGEMENT REVIEW, VOLUME 1, NO. 6: SUMMER 1978 Quarterly Report
Rowland G. Freeman, III, Paul Oliver, Ruth Davis, Harvey Tzudiker, and John Marciniak 1978 78 p refs
(AD-A061247) Avail: NTIS HC A05/MF A01 CSCL 09/2

Contents: Federal Government Software Conversion; Reducing Software Management Risks; Software Configuration Management Testability and Traceability; Software Acquisition within Air Force Systems Command-A Management Approach; Computer Systems in the Navy; Navy Airborne Weapon System Software Acquisition; The Eglin Real-Time Computer System; Software Reliability by Design-A Critical Need; Call for Manuscripts. GRA

N79-18803# Delft Hydraulics Lab. (Netherlands).
SCIENCE RESOURCES MANAGEMENT: INESCAPABLE, TRICKY, REWARDING
J. E. Prins Jul. 1977 16 p refs Presented at the Diamond Jubilee Symp., Poona, Nov. 1976
(Publ-18) Avail: NTIS HC A02/MF A01

Formulation of a national science policy is considered in terms of funding the various types of scientific research. The connection between scientific research and economic, social, and cultural developments in society, interaction between universities and research institutes, managerial capacity at the government level, and political decision making are among the topics discussed. J.M.S.

N79-18804# Denver Regional Council of Governments, Colo.
PROCESSED DATA ON MANAGEMENT INDICATORS
16 Jun. 1978 78 p Sponsored in part by Natl. Center for Productivity and Quality of Working Life, Washington, D. C.
(PB-288003/7) Avail: NTIS HC A05/MF A01 CSCL 05A

Tables on selected management indicators, an accompanying list of indicators, and a short questionnaire are presented. All data are for calendar year 1977; tables present draft or preliminary data. Every set of tables contains data for the six measurement categories established, including environment, operating characteristics, resources applied, workload, service level provided, and performance ratios. The data are formatted in three columns for each indicator. Columns consist of the absolute frequency, a rank order, and percentage. Rank order does not imply best and worst or good and bad. It is simply a method for identifying the relative position of one jurisdiction to another. GRA

N79-18823# Minnesota Univ., Minneapolis. Inst. of Public Affairs.
EFFECTS OF AN URBAN GROWTH MANAGEMENT SYSTEM ON LAND VALUES Final Report
M. E. Gleeson Mar. 1978 35 p refs
(Grant NSF AEN-76-06857)
(PB-288110/0; WORKING Paper-4; NSF/RA-780284) Avail: NTIS HC A03/MF A01 CSCL 13B

It can be argued that urban growth management systems segment a land market into distinct submarkets--those parcels of land which are developable at a particular point in time as distinct from those which are not developable due to public action. They do so by adding timing to the traditional control of type and location of development. This paper tests and confirms the expectation that segmenting a land market through operation of a growth management system leads to a divergence in land values between the developable and undevelopable portions. Conditions under which divergence occurs, and rival explanation for it occurrence also are explored. GRA

N79-18826# General Accounting Office, Washington, D. C. Community and Economic Development Div.
COMMUNITY-MANAGED SEPTIC SYSTEMS: A VIABLE ALTERNATIVE TO SEWAGE TREATMENT PLANTS Report to Congress
3 Nov. 1978 36 p
(PB-287981/5; CED-78-168) Avail: NTIS HC A03/MF A01 CSCL 13B

The benefits and obstacles concerning septic systems as variable waste water treatment alternatives to central treatment processes are discussed. Properly operating septic systems can be as permanent and effective as central treatment facilities, at considerably less cost. GRA

N79-18835# Rutgers Univ., Newark, N. J. Graduate School of Business Admin.
TECHNOLOGICAL INNOVATION POSITION PAPER
James D. Hlavacek 1978 12 p refs Sponsored by Dept. of Commerce.
(PB-287901/3) Avail: NTIS HC A02/MF A01 CSCL 05C

The majority of technological innovations have historically originated at small and medium size firms and not at large 'Fortune 500' corporations. A discussion is included of how capital shortage for small or new firms hinders growth plans, the negative effects of Federal regulations, and why large firms find it difficult to be innovative. The paper also investigates distribution and market development problems as these relate to innovation. It makes recommendations for Federal Government policy, including a recommendation for sponsoring educational seminars for U.S. businessmen describing why, when and how to structure and operate joint ventures. GRA

N79-18841# Illinois Inst. of Natural Resources, Springfield.
VANPOOL IMPLEMENTATION HANDBOOK
Jeffrey A. Dynis 1978 45 p refs Revised
(PB-289694/2; ILLDOE-78/12) Avail: NTIS HC A03/MF A01 CSCL 13B

The handbook is a detailed guide outlining the necessary steps for establishment of successful van-pool programs in the state of Illinois. The guide serves as a manual introducing and

outlining preliminary considerations, administrative methods, and legal considerations, as well as supplying sample forms which may be used for the administration and operation of privately sponsored van-pool programs. GRA

N79-18842# Mississippi State Univ., State College. Water Resources Research Inst.
METHODS OF EFFECT COST REDUCTIONS IN MUNICIPAL WATER SYSTEMS
Wayne E. Boyet, Kenneth W. Hollman, S. Cabell Shull, and Richard S. Glaze Sep. 1978 41 p Prepared in cooperation with Mississippi Univ., University
(Contract DI-14-34-0001-8026; OWRT Proj. A-116-MISS(2)) (PB-288315/5; W79-00678) Avail: NTIS HC A03/MF A01 CSCL 13B

A model for isolating the variables which affect significantly the cost of water sold by Mississippi municipal water systems was developed. Multiple regression analysis was used in the development of the predictive equations. The results provide information regarding the elasticity of cost with respect to size, as well as the relative impact of other physical, financial, and socioeconomic variables on water cost. The following procedure was used: (1) A cross section of 88 Mississippi municipal water firms comprised the study group; (2) Information on the selected systems was collected by means of interviews and from financial records and other secondary sources; and (3) Variables included in the analysis. GRA

N79-18846# Minnesota Univ., Minneapolis.
THE EFFECTS OF AN URBAN GROWTH MANAGEMENT SYSTEM ON PUBLIC SERVICES AND PUBLIC SERVICE COSTS
Michael E. Gleeson Mar. 1978 37 p refs
(Grant NSF AEN-76-06857)
(PB-288035/9; NSF/RA-780283) Avail: NTIS HC A03/MF A01 CSCL 13B

By concentrating physical development geographically, urban growth management systems seek to hold down public service costs or reduce service deficiencies resulting from rapid growth. This study tests the expectation that such systems can concentrate development and reduce public service costs without reducing level of services. The site for the study is Brooklyn Park, Minnesota, one of the nation's longest-operating growth management systems. Findings indicate that the system has had a concentrating effect and has produced significant savings in capital sanitary sewer, water, and storm sewer facilities (some 40%), without affecting output or impact of service. Several measurement and methodological issues also are discussed. GRA

N79-19605# Advisory Group for Aerospace Research and Development, Paris (France).
OPERATIONAL HELICOPTER AVIATION MEDICINE
S. C. Knapp, ed. (Army Aeromed. Res. Lab.) Dec. 1978 614 p refs In ENGLISH and FRENCH Meeting held at Fort Rucker, Ala., 1-5 May 1978
(AGARD-CP-255; ISBN-92-835-0226-4) Avail: NTIS HC A99/MF A01

Aviation medicine topics unique to helicopters, helicopter operations, and the aircrew who fly helicopters are discussed. Specific topics covered include: medical aspects of evacuation and search and rescue operations; environmental aspects of helicopter operations; helicopter operations crew fatigue; human factors of helicopter design and operations; visual and acoustic aspects of helicopter design and operations; and helicopter safety and crashworthiness.

N79-19655# Army Agency for Aviation Safety, Fort Rucker, Ala.
ENGINEERING ANALYSIS OF CRASH INJURY IN ARMY AIRCRAFT
James E. Hicks *In* AGARD Operational Helicopter Aviation Med. Dec. 1978 11 p refs

Avail: NTIS HC A99/MF A01

A methodology for identification of crashworthiness deficiencies in Army aircraft is discussed. The methodology provides for injury and impact data to be extracted from accident reports using a specially developed injury coding system. Personnel injuries are costed through a technique which provides for consideration of each injury based on its relative severity as determined by medical examination. Crash injury causes are identified and ranked according to the magnitude of their effect and probability of occurrence. The technique is designed to provide recommendations as to the most urgent crashworthiness research/development/procurement efforts for consideration by aircraft systems managers and aviation research laboratories. An application of the methodology to an operated Army aircraft is shown. Preliminary results as to the more significant crash hazards in this aircraft are discussed. Recommendations are made as to the use of the methodology and to additional investigation aids which would improve the future identifications of crash hazards. J.M.S.

N79-19737# Mitre Corp., Bedford, Mass.
SOFTWARE ACQUISITION MANAGEMENT GUIDEBOOK: REGULATIONS, SPECIFICATIONS, AND STANDARDS
J. B. Glore, M. P. Friedman, and S. M. Goheen Nov. 1978 216 p refs
(Contract F19628-78-C-0001)
(AD-A061793; MTR-3637; ESD-TR-78-178; ESD-TR-75-91) Avail: NTIS HC A10/MF A01 CSCL 09/2

This is one of the ESD Software Acquisition Management (SAM) Guidebook series. It identifies and categorizes regulations, specifications, and standards (RSS) relevant to acquisition of software for Air Force systems. This volume is a major revision of ESD-TR-75-91 (MTR-3080), October 1975. It identifies the version of each document mentioned in the original RSS guidebook and still in effect when this revision was prepared. It also identifies the additional RSS referenced in the other SAM guidebooks plus many other documents considered pertinent. The material has been substantially reorganized and reformatted for easier reference. For example, as an aid to retrieval by subject, the revision includes a Keyword in Context (KWIC) index of the titles and key title phrases of the relevant documents in effect when this revision was prepared. Author (GRA)

N79-19751# Tesseract Corp., San Francisco, Calif. Inst. for Computer Science and Technology.
COMPUTER SCIENCE AND TECHNOLOGY: GUIDELINE ON MAJOR JOB ACCOUNTING SYSTEMS: THE SYSTEM MANAGEMENT FACILITIES (SMF) FOR IBM SYSTEMS UNDER OS/MVT
Gary Durbin, Todd Kinney, Peter Lamasney, Edward Newman, and Edward Syrett Oct. 1978 196 p
(PB-289129/9; NBS-SP-500-40) Avail: NTIS HC A09/MF A01 CSCL 09B

The need for a better understanding of how job accounting systems work, what they measure, and how accurately they measure was studied. The accounting system described is IBM's System Management Facilities (SMF) for 360/370 environments operating under OS/MVT. Considerable detail is provided on SMF's activity in collecting the data necessary to account for resources used by the individual jobs in a multiprogramming system and to provide some indicators of the performance of the system itself. The accuracy, both absolute and relative, of SMF as a measurement tool and the costs entailed in the use of SMF was investigated. The experimental methodology used to explore these questions is summarized. GRA

N79-19912*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MANAGEMENT SYSTEM, ORGANIZATIONAL CLIMATE AND PERFORMANCE RELATIONSHIPS
Bervil D. Davis Feb. 1979 38 p refs
(NASA-TP-1417; M-281) Avail: NTIS HC A03/MF A01 CSCL 05A

Seven aerospace firms were investigated to determine if a relationship existed among management systems, organizational

climate, and organization performance. Positive relationships were found between each of these variables, but a statistically significant relationship existed only between the management system and organizational climate. The direction and amount of communication and the degree of decentralized decision-making, elements of the management system, also had a statisticallly significant realtionship with organization performance. Author

N79-19913# Washington Univ., Seattle. Dept. of Psychology.
THE CONTINGENCY MODEL FOR THE SELECTION OF DECISION STRATEGIES: AN EMPIRICAL TEST
Daniel W. McAllister, Terence R. Mitchell, and Lee Roy Beach Oct. 1978 25 p refs
(Contract N00014-76-C-0193)
(AD-A061904; TR-78-17) Avail: NTIS HC A02/MF A01 CSCL 12/2

A contingency model for the selection of decision strategies was described and tested. This model suggests that when decisions are more significant, the decision cannot be reversed, and the decision maker is responsible for his actions, then the decision strategy will be more analytic and result in a greater investment of time and effort than when the opposite conditions are true. Three studies tested and supported these assumptions. The results are discussed in terms of their implications for the further development of this particular model and for the field of decision making in general. Author (GRA)

N79-19914# Purdue Research Foundation, Lafayette, Ind.
ENHANCING PRODUCTIVITY THROUGH FEEDBACK AND JOB DESIGN Final Report, 1 Oct. 1976 - 31 Dec. 1977
Robert D. Pritchard, Raymond V. Montagno, and John R. Moore Aug. 1978 47 p refs
(Contract F33615-77-C-0026)
(AD-A061703; AFHRL-TR-78-44) Avail: NTIS HC A03/MF A01 CSCL 05/10

This research represents a study in a program to investigate potential sources of the intrinsic motivation of Air Force personnel. The first step in this process was an attempt to identify and list a number of sources of intrinsic motivation. From this list, feedback and job design were selected as sources that held promise for use in Air Force type settings. This report describes an attempt to manipulate several dimensions of feedback and the degree to which a person did a complete unit of work. A job simulation was employed to experimentally test the variables finally selected. The criteria for the task used in the simulation were that it have generalizability to the Air Force and that it possess acceptable face validity for the subjects participating in the study. The task used in this study involved the processing of purchase requisitions and was designed so that subjects believed they were working on a real job and so that there was distinct quantity and quality dimensions that could be measured. The results of the study indicated that feedback has great potential for improving productivity. However, different types of feedback had markedly different effects. The best type of feedback in this study was Impersonal, High Specificity, Individual feedback in either the Public or Private format. This combination of feedback resulted in a 26% increase in quantity and a 27% decrease in errors. Author (GRA)

N79-19915# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A MANAGEMENT INFORMATION SYSTEM TO ESTIMATE CONTROLLED MATERIALS REQUIREMENTS FOR AIR FORCE CONTRACTS M.S. Thesis
Thomas F. Pustis and David J. Wallace Jun. 1978 142 p refs
(AD-A061707; AFIT-LSSR-24-78A) Avail: NTIS HC A07/MF A01 CSCL 05/1

The purpose of the thesis effort was to plan and design a management information system for the Joint Aeronautical Materials Activity (JAMAC). The developed system generates materials requirement estimates for controlled materials used during performance of United States Air Force contracts. Controlled materials requirements for such contracts are prepared for seven program identification codes (A-1, A-2, A-6, A-7, C-2, C-3, and C-9) as established by the Defense Materials System. The computer program used to generate the requirements makes use of matrix algebra routines. System output includes the materials requirement estimates for each program identification code and accuracy/audit lists Author (GRA)

N79-19916# General Accounting Office, Washington, D. C. International Div.
FOREIGN-SOURCE PROCUREMENT FUNDED THROUGH FEDERAL PROGRAMS BY STATES AND ORGANIZATIONS
30 Nov. 1978 81 p refs
(PB-288823/8; ID-79-1) Avail: NTIS HC A05/MF A01 CSCL 05A

Foreign-source procurement funded through Federal programs by states and selected organizations is addressed. Legislation enacted this year at both the state and Federal levels considerably expands buy-national preferences for U.S. firms competing for such federally financed procurement. Federal and state buy-national preferences are identified and legal issues relating to state and local buy-national preferences are defined. Information on foreign-source procurement by states and organizations is provided for federally assisted highway, urban mass transportation, railroad, airport, municipal wastewater treatment, local public works, and rural electrification programs. GRA

N79-19917# American Univ., Washington, D. C.
FINANCIAL MANAGEMENT IN THE FEDERAL GOVERNMENT: A TREASURY PERSPECTIVE Final Report
James J. Lucas 18 Aug. 1978 106 p refs Sponsored in part by Bureau of Gov. Financial Operations, Wash., D. C.
(PB-288819/6; AU/IAPFM-24-77-3) Avail: NTIS HC A06/MF A01 CSCL 05A

The mechanics of the Treasury Department's central accounting and reporting system, are explained in order to: (1) create an awareness of the interrelationships that exist in the Federal financial community; (2) encourage greater government-wide cooperation in Treasury's objective to publish timely and accurate financial reports; and (3) reduce the incidence of reporting and communications problems which hinder the accomplishment of that objective. GRA

N79-19918 Purdue Univ., Lafayette, Ind.
A PLANNING MODEL FOR THE FINANCING OF INFORMATION CENTERS, VOLUME 1 AND 2 Ph.D. Thesis
David Leslie Levy 1978 627 p
Avail: Univ. Microfilms Order No. 7905743

The method presented here as an aid to managers is that of computerized planning models. The models developed here is called the Information Center Management Systems, ICMS, model. This model is a mangement tool designed to assist in the information center financial of a simulated information center. This simulated center can be the existing one incorporating policy changes, or one just starting operations. The ICMS model allows for the treament of the various aspects of financial management to be included in the performance analysis of the simulated centers. The ICMS model also provides the new information center manager with an instrument for learning about the financial management process and at the same time providing him an aid for financial management decisions. Dissert. Abstr.

N79-19922 Committee on Commerce, Science, and Transportation (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1979, PART 3
Washington GPO 1978 189 p refs Hearings on S. 2527 before the Subcomm. on Sci., Technol., and Space of the Comm. on Commerce, Sci., and Transportation, 95th Congr., 2d Sess., 8 and 16 Mar. 1978
(GPO-25-603-PT-3) Avail: Subcomm. on Sci., Technol., and Space

The policy basis of U.S. cooperation with other nations in space projects and technology applications is reviewed. Highlights

of current and planned reimbursable services and cooperative activities are summarized. The feasibility of a joint shuttle/Salyut mission and cooperation with the U.S.S.R., Canada, and France in a satellite-aided search and rescue demonstration project are examined. Shuttle utilization by DOD and other Defense Department activities of interest to NASA are discussed. A.R.H.

N79-19923 Committee on Commerce, Science, and Transportation (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1979, PART 2
Washington GPO 1978 418 p refs Hearings on S. 2527 before the Subcomm. on Sci., Technol., and Space of the Comm. on Commerce, Sci., and Transportation, 95th Congr. 2d Sess., 1 and 7 Mar. 1978
(GPO-25-603-PT-2) Avail: Subcomm. on Sci., Technol., and Space

Activities of NASA's Office of Space and Terrestrial Applications are described in support of funding requests. Testimony in response to specific questions related to technology utilization and transfer are included with illustrations of the slides used in the presentations. The need to fund innovative and creative educational programs to support growing student interest in space exploration is addressed by representatives of the Forum for the Advancement of Students in Science and Technology. A.R.H.

N79-19929 Lehigh Univ., Bethlehem, Pa.
THE DESIGN OF SOLID WASTE SYSTEMS: AN APPLICATION OF GEOMETRIC PROGRAMMING TO PROBLEMS IN MUNICIPAL SOLID WASTE MANAGEMENT Ph.D. Thesis
Wilson Winant Yale 1978 338 p
Avail: Univ. Microfilms Order No. 7904325

An attempt is made to development of nonlinear solid waste management models that more accurately approximate reality than previous attempts. Only cost minimization models are investigated. The nonlinear phenomena of economies of scale and diseconomies of scale pervade the cost structure of municipal solid waste models. Therefore, each mathematical model is a nonlinear programming problem which is solved by geometric programming. The nonlinear objective function models the fixed and variable costs of the solid waste system while the constraints impose technological, legal, and social restrictions upon the system. In general, the resulting geometric program can have reversed constraints, inactive constraints, and large degrees of difficulty. A solution procedure with a heuristic rule is developed and then utilized to obtain solutions to the geometric programs. Dissert. Abstr.

N79-19930 Committee on Commerce, Science, and Transportation (U. S. Senate).
OVERSIGHT OF SCIENCE AND TECHNOLOGY POLICY, PART 2
Washington GPO 1978 309 p refs Hearings before the Subcomm. on Sci., Technol., and Space of the Comm. on Commerce, Sci., and Transportation, 10 Feb. and 26 Apr. 1976
(GPO-28-948) Avail: Subcomm. on Sci., Technol., and Space

The Presidents's objectives concerning science and technology are reviewed and the overall status of research and development in the U.S. is assessed. Particular areas of concern are opportunities for younger scientists in academic departments and the lag in productivity and the decline of industrial innovation. The allocation of funds among the stages, performers, and purposes of research and development is examined in relation to other government policies affecting the contribution of science and technology to the nation's needs. Articles, letters, and statements are included with the direct testimony. A.R.H.

N79-19931*# Kentucky Univ., Lexington. Center for Public Affairs.
NASA-UK STAP: A TECHNOLOGY APPLICATIONS PROGRAM TO AID GOVERNMENT AND INDUSTRY IN KENTUCKY Annual Report
1978 13 p Sponsored by NASA
Avail: NTIS HC A02/MF A01 CSCL 05A

There is a need for a well-defined partnership between universities, and the business and industrial community to promote the transfer of technology. In an effort to foster such a partnership, the Space Systems Program, administered by NASA, has established information dissemination centers in cooperation with various universities throughout the country. As a result of limited success in the transfer of technology to state and local units of government NASA felt that new stimuli and new approaches were needed in the public sector area. NASA selected the University of Kentucky, a land grant institution with a significant research dissemination and service role, as the site for the new program. An annual report of this program at the University of Kentucky is presented. G.Y.

N79-19939# Vermont Univ., Burlington. Dept. of Agricultural and Resource Economics.
ECONOMIC ANALYSIS OF ALTERNATIVE SLUDGE DISPOSAL METHODS IN VERMONT Final Project Completion Report, 1 Oct. 1976 - 30 Sep. 1977
Richard G. Fritz Jun. 1978 110 p refs
(Contract DI-14-34-0001-7096)
(PB-288920/2; W79-01328; OWRT-A-031-VT(1)) Avail: NTIS HC A06/MF A01 CSCL 13B

Information is provided on the costs of municipal sewage sludge disposal in Vermont. The costs of two methods of disposal, landfill and landspreading, factors which influenced disposal costs, the economic benefits of landspreading disposal, and a regional plan for sludge disposal are among the topics covered. An analysis of variance indicated, however, that per capita disposal costs associated with the use of flotation thickeners and vacuum filters were significantly higher than those associated with liquid and sand drying bed dewatered sludge disposal. Total costs of liquid sludge disposal were much more responsive to changes in distances to disposal sites than were total costs associated with dewatered sludge disposal. GRA

N79-19947# Industrial Innovation Coordinating Committee, Washington, D. C. Advisory Committee on Industrial Innovation.
DIRECT FEDERAL SUPPORT OF RESEARCH AND DEVELOPMENT: DRAFT REPORT
Dec. 1978 17 p
(PB-290407/6) Avail: NTIS HC A02/MF A01 CSCL 05A

The conclusions of the Panel on Direct Federal Support of Research and Development to stimulate innovation are presented. The panel identified three sectors from which one could expect a disproportionately accelerated rate of innovation provided that institutionalized mechanisms are created to provide the essential coupling between the generation of R&D and its utilization in new products, processes or test methods. These three sectors are respectively: the university environment, small venture businesses, and trade associations. The panel considered why each such sector lends itself to a boost in innovative capacity and proposes budgetary and institutional mechanisms to effect this. GRA

N79-19948# Industrial Innovation Coordinating Committee, Washington, D. C.
PUBLIC SYMPOSIUM ON DIRECT FEDERAL SUPPORT OF RESEARCH AND DEVELOPMENT
Jan. 1979 177 p Symp. held at Washington, D. C., 16 Jan. 1979
(PB-290408/4) Avail: NTIS HC A09/MF A01 CSCL 05A

Industrial innovation is discussed in terms of maintaining rapid industrial/economic growth, high productivity, and a competitive advantage in foreign markets. Emphasis is placed on the influence of direct Federal support of research and development. Social and economic factors are included. J.M.S.

N79-19949# Industrial Innovation Coordinating Committee, Washington, D. C. Advisory Committee on Industrial Innovation.
REGULATION OF INDUSTRY STRUCTURE AND COMPETITION: DRAFT REPORT

Dec. 1978 50 p refs
(PB-290409/2) Avail: NTIS HC A03/MF A01 CSCL 05A

In its study of the innovation climate in the U.S. and government's effect upon industry structure and competition, the subcommittee reached one over-riding conclusion. That is that the policies as well as the philosophy that today guide antitrust and regulatory practice must be rethought in light of a variety of new worldwide economic forces that now prevail and the less dominant role this country occupies on the economic stage. It is in these two important areas of government interaction with business -- regulation and antitrust -- where the most profound effects are present in the structural and competitive nature of American business and industry. GRA

N79-19950# Industrial Innovation Coordinating Committee, Washington, D. C.
PUBLIC SYMPOSIUM ON REGULATION OF INDUSTRY STRUCTURE AND COMPETITION
Jan. 1979 170 p Symp. held at Washington, D. C., 19 Jan. 1979
(PB-290410/0) Avail: NTIS HC A08/MF A01 CSCL 05A

The impact of government policies on innovation in the industrial sector is considered. Emphasis is on government regulatory processes and their affect on industry structure and competition. J.M.S.

N79-19951# Industrial Innovation Coordinating Committee, Washington, D. C. Advisory Committee on Industrial Innovation.
REVIEW AND RECOMMENDATIONS OF POLICY ALTERNATIVES OF THE PUBLIC INTEREST ADVISORY SUBCOMMITTEE: DRAFT REPORT
Dec. 1978 59 p refs
(PB-290411/8) Avail: NTIS HC A04/MF A01 CSCL 05A

Government policies that promote innovations of a type that will further the goals of our society and will fulfill the basic social and human needs of its citizens are considered. The Public Interest Subcommittee advocates the development of good, quantified social indicators. The Subcommittee also urges the improvement of economic indicators now in use, including indicators that would measure the many factors that affect productivity. GRA

N79-19952# Industrial Innovation Coordinating Committee, Washington, D. C.
PUBLIC SYMPOSIUM ON PROCUREMENT
Jan. 1979 186 p Symp. held at Washington, D. C., 15 Jan. 1979
(PB-290414/2) Avail: NTIS HC A09/MF A01 CSCL 05A

Government procurement policy is discussed in terms of enhancing innovation in the industrial sector. Patent policy and marketing are among the factors covered. Emphasis is placed on increased productivity through industrial innovation. J.M.S.

N79-19953# Industrial Innovation Coordinating Committee, Washington, D. C.
PUBLIC SYMPOSIUM ON ECONOMIC AND TRADE POLICY
Jan. 1979 191 p Symp. held at Washington, D. C., 22 Jan. 1979
(PB-290416/7) Avail: NTIS HC A09/MF A01 CSCL 05A

Factors that enhance industrial innovation in the United States are examined. The role of Federal policies, regulations, and programs on innovation in the industrial sector is emphasized. J.M.S.

N79-19954# Industrial Innovation Coordinating Committee, Washington, D. C.
FEDERAL PROCUREMENT POLICY: DRAFT REPORT
Dec. 1978 92 p refs
(PB-290417/5) Avail: NTIS HC A05/MF A01 CSCL 05A

The United States public and private enterprise combined is funding research and development at a slower rate than in past decades. Excessive taxes on capital gains and burdensome regulatory barriers have reduced investment incentives; organized opposition to technological change has further discouraged innovation. The long term consequences include lower productivity, high costs, inflation, unemployment, balance of payment problems, and a lower standard of living. Because it does have such great power over industry, the government can stimulate renewed investment in innovation through improved procurement practices, stronger support of industrial research and development, and tax reform that removes penalties for entrepreneurial capital investment. GRA

N79-19955# Brussels Univ. (Belgium).
THE DYNAMICS OF URBAN EVOLUTION. VOLUME 1: INTER-URBAN EVOLUTION Final Report, May 1976 - Jun. 1977
P. M. Allen, J. L. Deneubourg, M. Sanglier, F. Boon, and A. dePalma Oct. 1978 85 p refs 2 Vol.
(Contract DOT-TSC-1185)
(PB-288957/4; DOT-TSC-RSPA-78-20-Vol-1) Avail: NTIS HC A05/MF A01 CSCL 13B

The concept of 'order by fluctuation', that has appeared recently in physico-chemical and biological systems, is applied to the description of urban growth. It is shown that fluctuations play a vital role in the evolutionary process of urban growth. The evolution of a complex system cannot be known simply by studying deterministic equations describing the system. It is necessary, in addition, to study the effects of fluctuations, or historical accident, which can drive the system to new modes of behavior. Taking account of both the deterministic elements of urban growth and the appearance of innovations at chance locations in an economic region, a transportation-sensitive dynamic model of the evolution of the organization of urban centers was developed. GRA

N79-19956# Brussels Univ. (Belgium).
THE DYNAMICS OF URBAN EVOLUTION. VOLUME 2: INTRA-URBAN EVOLUTION Final Report, May 1976 - Jun. 1977
P. M. Allen, J. L. Deneubourg, M. Sanglier, F. Boon, and A dePalma Oct. 1978 139 p refs 2 Vol.
(Contract DOT-TSC-1185)
(PB-288958/2; DOT-TSC-RSPA-78-20-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 06F

A methodology capable of a multidisciplinary treatment of transportation planning was developed. The prediction of the consequences of modification in the transport system on the social, demographic, economic, and ecological structure of the total system was emphasized. J.M.S.

N79-20760# Advisory Group for Aerospace Research and Development, Paris (France).
COMPUTER AID IN THE PRODUCTION DESIGN OFFICE
Jan. 1979 56 p In ENGLISH and partly in FRENCH Papers presented at the 47th Meeting of the AGARD Struct. and Mater. Panel, Florence, 25-26 Sep. 1978
(AGARD-CP-250; ISBN-92-835-0229-9) Avail: NTIS HC A04/MF A01

The requirements with respect to software and hardware from different points of view and the close relationship between CAD and CAM are presented. The application of CAD to special systems and components of an aircraft is covered.

N79-20761# Computer Aided Design Centre, Cambridge (England).
GRAPHICAL NC SYSTEMS AS A BASIS FOR PROGRESS TOWARDS THE INTEGRATION OF DESIGN, PLANNING AND MACHINING
B. Gott *In* AGARD Computer Aid in the Production Design Office Jan. 1979 8 p
Avail: NTIS HC A04/MF A01

The systems described are concerned with piece parts on production and design for production. Numerical control of programming, machining, and graphical methods in the computer aided and manufacture throughout all sectors of industry. S.E.S.

N79-20853# National Bureau of Standards, Washington, D. C.
ANALYTICAL METHODS FOR SAFEGUARDS AND ACCOUNTABILITY MEASUREMENTS OF SPECIAL NUCLEAR MATERIALS
H. Thomas Yolken and John E. Bullard (Babcock and Wilcox Co., Lynchburg, Va.) Nov. 1978 297 p Presented at Amer. Nucl. Soc. Topical Meeting, Williamsburg, Virginia, 15-17 May 1978
(PB-289112/5; NBS-SP-528) Avail: NTIS HC A13/MF A01 CSCL 18I

The latest techniques for chemical analysis of special nuclear materials and to strengthen lines of communication among scientists working in this field were discussed. Advanced analytical chemistry techniques, mathematical correction models, and wet chemistry methods for elemental content are included. Examples of remote systems for handling highly radioactive samples for analysis are given. Progress was made on the problems associated with obtaining high precision and accuracy for analysis of special nuclear materials. Computer-controlled operating systems with built-in safe-guards and quality assurance programs are described. Current trends in the fuel cycle, along with future approaches to control and accountability of special nuclear materials, are discussed. GRA

N79-20904# North Carolina State Univ. at Raleigh.
FUNDAMENTAL CONCEPTS IN DISCRETE OPTIMIZATION AS RELATED TO CLASSES OF SCHEDULING PROBLEMS Final Report, 15 May 1972 - 14 Aug. 1978
Salah E. Elmaghraby 10 Nov. 1978 22 p refs
(Grants DAHC04-75-G-0181; DAAG29-76-G-0181; DA-ARO-(D)-31-124-72-G106)
(AD-A062129; ARO-10202.12-M; ARO-131-10-M) Avail: NTIS HC A02/MF A01 CSCL 12/2

Work accomplished over the first three years (1972-75) may be summarized as follows: (1) An extensive study of models for optimally scheduling lots of N products on a single processor under various demand process structures. (2) Solution of a problem of scheduling N jobs on parallel processors to minimize a penalty function based on job due dates when there are no precedence relations among jobs. (3) Two studies treating the efficient solution of minimum cost flow problems. (4) Research on methodologies for discrete optimization related to: (1) Tree search in methods of implicit enumeration; (2) Circumventing the 'curse of dimensionality' in dynamic programming; and (3) The reduction method of integer programming for a specialized version of the generalized assignment problem. (4) Surveys of past and current research in: (1) Scheduling multiple processors; (2) Flow networks; (3) Project planning networks; (4) Basic concepts used in branch-and-bound; and (5) Production planning. GRA

N79-20905# California Univ., Berkeley. Operations Research Center.
DYNAMIC THEORY OF PRODUCTION CORRESPONDENCES, PART 4
Ronald W. Shephard and Rokaya A. Al-Ayat Aug. 1978 67 p
(Contract N00014-76-C-0134; Grant NSF MCS-77-16054)
(AD-A062470; ORC-78-15) Avail: NTIS HC A04/MF A01 CSCL 05/1

Chapter 10 of a monograph on a Dynamic Theory of Production Correspondences is presented. A network of correspondences is defined and properties are investigated. General technical coefficient form of network correspondences are introduced and several special structures are considered with algorithms for computing greedy histories of input and output rate histories. Author (GRA)

N79-20906# National Science Foundation, Washington, D. C. Div. of Science and Resources Studies.
DETAILED STATISTICAL TABLES. RESEARCH AND DEVELOPMENT IN INDUSTRY, 1976. FUNDS, 1976. SCIENTISTS AND ENGINEERS, JANUARY 1977 Final Surveys of Science Resources Series
Dec. 1978 82 p
(PB-289719/7; NSF-78-314) Avail: NTIS HC A05/MF A01 CSCL 05A

Data on the dollar volume of research and development performed in the industrial sector, sources of financing, numbers of R&D scientists and engineers, and other economic characteristics of the industrial R&D effort are presented. GRA

N79-20907# Auburn Univ., Ala. Water Resources Research Inst.
MANAGEMENT OF LOCAL WATER SYSTEMS IN ALABAMA. PART 1: THE CASE OF CALHOUN AND CLEBURNE COUNTIES. PART 2: SOME POLITICAL AND ECONOMIC ASPECTS OF WATER AGENCIES IN ALABAMA
William M. Kimmelman Sep. 1978 117 p refs Sponsored by Dept. of the Interior Prepared in cooperation with Alabama Univ., Birmingham
(PB-289222/2; WRRI-Bull-34-Pt-1; WRRI-Bull-34-Pt-2; W79-01536; OWRT-A-050-ALA(1)) Avail: NTIS HC A06/MF A01 CSCL 13B

Two public water systems in Calhoun and Cleburne Counties, Alabama were studied. The focus is on major political and economic dimensions that play a key role in the management of water systems in Alabama. It is shown that the problem of water management is less one of overall supply than the lack of necessary political-economic organizations in getting water from where it is to where it is needed. While concentrating on local public water systems which provide direct water services, how state agencies establishing to coordinate, regulate and influence water use can facilitate or inhibit the performance of local public water supply system also considered. GRA

N79-20908* National Aeronautics and Space Administration, Washington, D. C.
NASA PATENT ABSTRACTS BIBLIOGRAPHY. A CONTINUING BIBLIOGRAPHY. SECTION 1: ABSTRACTS
Jan. 1979 77 p
(NASA-SP-7039(14)-Section-1) Avail: NTIS HC E04 CSCL 05B

Abstracts are cited for 213 patents and applications for patent introduced into the NASA scientific and technical information system during the period of July 1978 through December 1978. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent. G.Y.

N79-20912# Advisory Group for Aerospace Research and Development, Paris (France).
INFORMATION AND INDUSTRY
Jan. 1979 90 p refs In ENGLISH and FRENCH Meeting held in Paris, 18-19 Oct. 1978
(AGARD-CP-246; ISBN-92-835-0228-0) Avail: NTIS HC A05/MF A01

Industrial information requirements, mechanisms for information transfer, management considerations in information transfer, and representative national programs are presented.

N79-20916# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).
LITERATURE MECHANISMS. INFORMATION MANAGEMENT .N INDUSTRIAL ORGANIZATIONS
Heinz Goehre *In* AGARD Inform. and Ind. Jan. 1979 11 p

Avail: NTIS HC A05/MF A01

Information transfer in industrial organizations, information requirements and technological action, channels of information transfer, barriers to information transfer, and information management in Germany are discussed. S.E.S.

N79-20918# Pera, Melton Mowbray, Leicester (England).
TECHNOLOGY TRANSFER FOR MANUFACTURING INDUSTRIES
D. F. Galloway *In* AGARD Inform. and Ind. Jan. 1979 7 p

Avail: NTIS HC A05/MF A01

Technology which factories can best utilize, the time and cost of effecting technology transfer, the likely influence of human psychological factors in impeding technology transfer, and the influence the history and the incentives and disincentives of the plant and industry are predicted. The progression of improved manufacturing techniques form the initial stage of scientific possibility to the final stage of extensive profitable application in industry was studied. S.E.S.

N79-20920# King Research, Inc., Rockville, Md.
INFORMATION TRANSFER COST/BENEFIT ANALYSIS
Donald W. King and Nancy K. Roderer *In* AGARD Inform. and Ind. Jan. 1979 10 p refs

Avail: NTIS HC A05/MF A01

A framework for performing cost/benefit analysis of information transfer systems is provided. A cost model is developed for each of these components consisting of cost factors such as number of journal articles (for secondary information systems) and cost elements such as labor, equipment, supplies and so on. Improved performance and effectiveness is assumed to lead to increased benefits which can be measured in terms of value, social benefit and so on. S.E.S.

N79-20921# Association of Special Libraries and Information Bureaux, London (England).
EVALUATION OF INFORMATION SERVICES: RESEARCH AND REALITY
P. H. Vickers *In* AGARD Inform. and Ind. Jan. 1979 5 p refs

Avail: NTIS HC A05/MF A01

The state of the development of evaluation philosophy and methods are reviewed. The broad scope of evaluation techniques that are required for different types of systems and services is presented. The approach used in evaluating information services is described. The objectives of the service by careful analysis of the information requirements of the organization are defined. S.E.S.

N79-20922# National Research Council of Canada, Ottawa (Ontario). Technical Information Service.
INFORMATION AND ASSISTANCE SERVICES TO THE MANUFACTURING INDUSTRY IN CANADA
G. Kirouac *In* AGARD Inform. and Ind. Jan. 1979 5 p refs

Avail: NTIS HC A05/MF A01

The Technical Information Service (TIS) of the National Research Council is a technology transfer service to assist manufacturing industry. TIS is operated through field offices to ensure the most direct contact possible with industry. A question-and-answer service in the field of science and technology is provided. An engineering service to assist industry with its production problems is given. A program to keep industry abreast of new developments is offered. The benefits to industry and government, as well as a recent student program to extend the assistance already given by its regular staff are described. S.E.S.

N79-20926# Advisory Group for Aerospace Research and Development, Paris (France).
TRANSFERRING TECHNOLOGY TO INDUSTRY THROUGH INFORMATION
Louis Mogavero *In its* Inform. and Ind. Jan. 1979 6 p

Avail: NTIS HC A05/MF A01

A better understanding of the NASA transfer process, how it works, and the levels of effectiveness with which each element operates were studied. Similarities in technologies that generate economic benefits were examined. The role in guiding research and development, extracting its results, and packaging and disseminating the knowledge for specific uses in the industrial marketplace are presented. S.E.S.

N79-20928 Committee of the Whole House on the State of the Union (U. S. House).
AUTHORIZING APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington GPO 1979 237 p refs Rept. together with additional views to accompany H.R. 1786 from the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 19 Mar. 1979
(H-Rept-96-52; GPO-41-646) Avail: US Capital, House Document Room

Increases and reductions in NASA's request for funding to support research and development, construction of facilities, and program management are justified in an analysis of H.R. 1786 which is recommended for passage. A.R.H.

N79-20929 California Univ., Berkeley.
A MACROSCOPIC METHODOLOGY FOR TRANSPORTATION POLICY ANALYSIS Ph.D. Thesis
Paul Miron Schonfeld 1978 237 p
Avail: Univ. Microfilms Order No. 7904597

A methodology for urban transportation planning and policy analysis was developed to permit multidimensional and yet integrated assessment of a wide variety of options. The range of options analyzed includes network configuration and scale, modal technology, vehicle design, service policy, traffic management, pricing and other incentives, financing, investment, and regulation options considered either singly or in combinations. The salient features of this methodology are an emphasis on transportation functions rather than spatial detail, the extension of conventional economic theory to account for user contributions in the production of transportation services, and the use of constrained optimization techniques to structure and expand the scope of the analysis. Dissert. Abstr.

N79-20930*# North Carolina Science and Technology Research Center, Research Triangle Park.
A REGIONAL TECHNOLOGY TRANSFER PROGRAM Final Report
1978 38 p
(Contract NASw-3055)
(NASA-CR-158436) Avail: NTIS HC A03/MF A01 CSCL 05B

The final report is presented for the North Carolina Science and Technology Research Center's 14th consecutive contract period as a NASA Industrial Applications Center, serving the information needs of nine Southeastern states. Included in the report are figures for and analysis of marketing efforts, file usage, search delivered, and other services performed for clients; and information on staff changes, workshops, and special projects in 1978. An appendix contains copies of NC/STRC magazine advertisements, letters from clients, and supplementary information on NC/STRC staff and services. G.Y.

N79-20933# Hydrocomp, Inc., Palo Alto, Calif.
PLANNING AND MODELING IN URBAN WATER MANAGEMENT
Anthony S. Donigian, Jr. and Ray K. Linsley Oct. 1978 171 p refs
(Contract DI-14-34-0001-6222)
(PB-289891/4; W79-02288) Avail: NTIS HC A08/MF A01 CSCL 13B

Three hundred forty-nine planning and public works agencies were surveyed to evaluate and analyze the use of modeling for the planning and management of the urban water problems in order to determine the extent of model usage and the impact of modeling on policy and decision making. Eight case studies of modeling applications by cities, counties, and regional agencies are documented. The case studies include a variety of model types and water problems to demonstrate the utility of modeling for urban water planning and management. GRA

N79-21036# Federal Aviation Administration, Washington, D. C. Systems Research and Development Service.
MASTER PLAN FLIGHT SERVICE STATION AUTOMATION PROGRAM

Jan. 1978 82 p refs
(AD-A052001/5; FAA-FSS-01A) Avail: NTIS HC A05/MF A01 CSCL 17/7

The Master Plan for the Flight Service Automation Program is a planning document for the implementation of the Flight Service Information System and serves as the acquisition authorization document. This document contains background and introductory information relating to the present system of 292 manned domestic Flight Service Stations, program objectives, requirements, planning guidelines, systems and system interface descriptions, scheduling and implementation information, relationships with other major programs, management method, logistics, staffing, training, security, and financial planning information. Author

N79-21233# Coast Guard, Washington, D.C. Merchant Marine Safety.

LIQUEFIED NATURAL GAS SAFETY RESEARCH OVERVIEW Final Report

Alan L. Schneider Dec. 1978 72 p refs Presented at the LNG Terminal and Safety Symp., San Diego, Calif., 12-13 Oct. 1978; sponsored by the Am. Gas Assoc. and the Cryogenic Soc. of Am.
(AD-A063714) Avail: NTIS HC A04/MF A01 CSCL 21/4

Liquefied Natural Gas (LNG) is a growing factor in the United States energy supply situation, both for periods of high demand, peak shaving, and for daily supply (base load). Safety has been a major issue in its acceptance by the public, the government, and industry. Perhaps because of this, industry and government have undertaken programs of research, development, testing, and evaluation that are more extensive than those for most other new hazardous materials. This paper records the experimental and theoretical work performed with the goal of increasing LNG safety, and has been organized in fourteen divisions; land storage tank studies, rollover, dispersion from spills on land, land spill fire studies, land spill fire protection, ship studies, flameless explosion, dispersion from spills on water, underwater releases, water spill fire studies, vapor cloud deflagration, vapor cloud detonation, physical properties, and gelation. Examining the record of the LNG research effort leads inevitably to the conclusion that there is a basic understanding of the material, sufficient to design, operate, and regulate LNG transportation and storage. Author (GRA)

N79-21681# American Society of Civil Engineers, New York. Urban Water Resources Research Council.

URBAN RUNOFF CONTROL PLANNING

Murray B. McPherson Oct. 1978 196 p refs
(PB-291522/1; EPA-600/9-78-035) Avail: NTIS HC A09/MF A01 CSCL 13B

The importance of conjunctive consideration of urban runoff quantity and quality and the need to development a factual basis that will support expected reliability of performance of proposed actions and programs are emphasized. While not intended as a handbook for urban runoff control planning, this report delves into some important technical issues that are often slighted or poorly handled, such as the utilization of simulation. Recognizing that the ultimate test of any plan lies in its implementation, topics are viewed from the perspective and experience of the local government level where implementation takes place. GRA

N79-21930 Ohio State Univ., Columbus.

AN ANALYSIS AND EVALUATION OF STRUCTURED DECISION SYSTEMS Ph.D. Thesis

Mary Jane Lee 1978 294 p
Avail: Univ. Microfilms Order No. 7908169

A basis for a systematic, performance-oriented methodology was analyzed for representing and evaluating complete decision systems. Markovian and Bayesian probability techniques were utilized to analyze the sequences of states. The Markov analysis showed that levels of performance with respect to criterion specifications are directly associated with the levels and quantity of information displayed. The major results of the Bayesian convergence and discriminability analysis were that high convergence rates to steady-state transition probabilities of the Markov analysis and high discriminability were indicated in displays containing both high and low levels of information while low convergence rates and discriminability were found in displays with low levels of information displayed. From the development of the conceptual representation of complete decision systems and Markov chain analysis of the system, a formal decision systems model evolved as a stochastic finite state machine. Dissert. Abstr.

N79-21931 Ohio State Univ., Columbus.

FREQUENCY OF INFORMATION IN MANAGEMENT INFORMATION SYSTEMS Ph.D. Thesis

Satish Ramanlal Desai 1978 191 p
Avail: Univ. Microfilms Order No. 7908135

A quantitative analysis was utilized to design the frequency of the management information system. A model depicting the interrelationships among information, information frequency, management control action, and management objectives is developed in the contexts of a generalized management and control system. A decision strategy to assist the decision maker in the choice of the frequency of management information was developed. Optimizing conditions are developed for the information frequency model. Some principles for the decomposition of a complex management and control problem was developed into a number of distinct simple subproblems and illustrate a modeling approach to address the information frequency problem for multi-level siutations. Dissert. Abstr.

N79-21946# Municipal Environmental Research Lab., Cincinnati, Ohio. Wastewater Research Div.

URBAN STORMWATER MANAGEMENT WORKSHOP PROCEEDINGS

Richard Field Aug. 1978 130 p refs Workshop held at Edison, N. J., 1 Dec. 1977
(Contract EPA-68-03-2617; Grant EPA-R-802411)
(PB-288801/4; EPA-600/9-78-017) Avail: NTIS HC A07/MF A01 CSCL 13B

Topics covered include: urban stormwater management and technology manual (update); comprehensive planning for control of urban storm runoff and combined sewer overflows; low cost-effective alternative and comparative analysis from 208 areawide assessment study on combined sewer overflow and urban stormwater pollution; statistical characterization of runoff loading rates and cost functions of control measures; dry weather pollutant deposition in sewerage systems and associated first flush combined sewer overflow pollution control by dry weather sewer flushing; and nonpoint pollution abatement through improved street cleaning practices. GRA

N79-21948# National Science Foundation, Washington, D. C. Applied Science and Research Applications.

INTERGOVERNMENTAL SCIENCE AND PUBLIC TECHNOLOGY, VOLUME 2

Sep. 1978 81 p
(PB-289619/9; NSF-78-54-Vol-2; NSF/RA-780331-Vol-2; Program-Rept-6) Avail: NTIS HC A05/MF A01 CSCL 05A

The intergovernmental science and public technology (ISPT) program aims to: (1) experiment with incentives to accelerate introduction of innovation technology into commercial applications; (2) bring S&T (science and technology) into the policy making process in state and local government and (3) disseminate research results. The ISPT supports research and conducts experiments on the structure of new institutions in both the public and private sectors. These institutions represent new partnerships among universities, industries, state and local government between those who conduct research and those who utilize it. The theme is institution building with both researchers and users playing a joint, complementary role. GRA

N79-21949# Dayton Univ. Research Inst., Ohio.
TECHNOLOGY ASSESSMENT AN APPRAISAL OF THE STATE OF THE ART Final Report
Joseph P. Martino, Ralph C. Lenz, Jr., and LueiLin Chen Sep. 1978 247 p refs
(Grant NSF OPA-77-20685)
(PB-290235/1; UDRI-TR-78-81; NSF/PRA-7720685/1) Avail: NTIS HC A11/MF A01 CSCL 05A

Synthesis of the presentations and discussions of a workshop held in Dayton, Ohio in 1977 to appraise the state-of-the-art of technology is presented. Three major types of ideas about technology assessment came out of the workshop. The first of these dealt with the elements of a technology assessment, or the instrumental objectives which must be achieved during the conduct of a technology assessment, and which must be seen to have been accomplished when it is completed. The second major type had to do with the conduct of a technology assessment, that is, with the choices which have to be made before and during the performance of a technology assessment, primarily from the standpoint of carrying it out in an effective manner. The third type of idea had to do with managing a technology assessment team. GRA

N79-21950# Public Technology, Inc., Washington, D. C.
IMPROVING TRANSIT PERFORMANCE: PROCEEDINGS OF THE NATIONAL CONFERENCE
Jan. 1978 167 p Presented at 1st National Conf. on Transit Performance, Norfolk, Va., 18-21 Sep. 1977
(PB-291032/1; UMTA-DC-06-0184-78-1) Avail: NTIS HC A08/MF A01 CSCL 13B

The proceedings of the conference, namely the addresses, the issue and resource papers, and summaries of the problems and recommendations developed in workshop sessions are documented. Subject papers include: Trends in Transit Performance; Concepts and Indicators; Revenue Policy and Pricing; Service Characteristics; Labor Management Relations; Internal Management; Transit Performance Indicators; Case Studies of New York City, Southern California Rapid Transit District, and Seattle Metro; and Effects of Fare Charges. An annotated bibliography and lists of conferees, members of the planning group, and technical advisors are reported. GRA

N79-21951# Weston Environmental Consultants-Designers, West Chester, Pa.
MULTIPLE WATER SUPPLY APPROACH FOR URBAN WATER MANAGEMENT Final Report
Arun K. Deb 15 Nov. 1978 187 p refs
(Grant NSF ENV-76-18499)
(PB-290203/9; NSF/RA-780350) Avail: NTIS HC A09/MF A01 CSCL 13B

A systems model for technical and economic analysis of an urban water system having multiple sources and multiple distribution systems is described. Background information on multiple water systems, a description of the collection and analysis of water demand data used in developing the system, water quality and treatment requirements in water supply systems, optimization in the design of pumping stations, development of the systems model, and application methodology are presented. Bottled water supply as an alternative to the potable system and point-of-use water treatment as an alternative to the potable system are analyzed and evaluated. The computer systems model developed is described in terms of function, design, capabilities, design restraints, hardware requirements, and functional aspects. GRA

N79-22329# Maryland Univ., College Park. Fire Protection Curriculum.
A THEORETICAL RATIONALIZATION OF A GOAL-ORIENTED SYSTEMS APPROACH TO BUILDING FIRE SAFETY
Jack Watts 28 Feb. 1979 265 p refs Sponsored in part by HEW
(Grant NBS-7-9007)
(NBS-GCR-79-163) Avail: NTIS HC A12/MF A01

The GSA approach is described and analyzed and a more scientific procedure by synthesizing GSA concepts with additional probability theory is formulated. Discussion of systems analysis and modeling concepts emphasizes the need for probabilistic considerations of fire safety. The revised model simplifies data requirements through parameter estimation techniques. The approach is consistant with the GSA model for several example cases. A demonstrated advantage of the methodology is the facility for sensitivity analysis of alternative fire protection strategies. G.Y.

N79-22596# Maryland Univ., College Park. Water Resources Research Center.
EVALUATION OF ALTERNATIVE STORMWATER MANAGEMENT POLICIES
Richard H. McCuen and Gregory E. Kamedulski Oct. 1978 16 p refs
(Contract DI-14-34-0001-8022)
(PB-291736/7; TR-50; W79-03039; OWRT-A-047-MD(1)) Avail: NTIS HC A02/MF A01 CSCL 13B

Stormwater management is recognized as a requisite to controlling storm runoff from developing areas. To best meet societal needs, numerous policies have been adopted to meet the intent of stormwater management. Unfortuntely, many policies are deficient in their failure both to lead to designs that meet the intent of stormwater management and to provide the proper guidelines for translating policy into a design that provides the maximum benefit to society. Specific deficiencies of many policies include: (1) the use of single frequency; (2) neglect of storm duration; (3) inadequate consideration of maintenance; (4) insensitivity to the importance of soil characteristics; (5) lack of recognition of differences between water quantity and quality control; and (6) lack of consideration of downstream effects of detention storage. The effect of these policy deficiencies were evaluated. GRA

N79-22650# Nuclear Services Corp., Campbell, Calif.
ASSESSMENT OF QUALITY ASSURANCE IN NON-NUCLEAR POWER PLANTS Final Report
Jack Weber Jul. 1978 104 p Sponsored by California Energy Commission
(PB-289842/7; CAEC-008) Avail: NTIS HC A06/MF A01 CSCL 10B

The effectiveness is examined of current management controls used to ensure that design intent is met for equipment used by California utilities in non-nuclear power plants. Seven possible quality assurance programs are discussed, and a recommended program is presented. Check-sheets containing questions about management controls were used during interviews with the management of each of the five major California utilities, and during visits to five operating power plants. Among the management controls examined were: personnel training, instructions from management, information flow, records maintenance, verification testing, equipment storage, and review of controls to measure their effectiveness. Each control was examined for four organization levels; upper management, engineering, construction, and operations. All the utilities had some managerial controls implemented effectively, but none of the utilities had all the controls in operation. A quality assurance program that the California Energy Commission should require for future power plant projects is outlined. Quantitative cost-benefit studies are recommended before implementing any quality assurance program. GRA

N79-22777# General Research Corp., McLean, Va.
AUTOMATED PERSONNEL DATA BASE SYSTEM SPECIFICATIONS, TASK 5 Final Report
Hugh J. Bartley, Alexander K. Bocast, Francis O. Deppner, Oscar J. Harrison, and Irene W. Kraas Nov. 1978 157 p
(PB-291848/0; NUREG-CR-0045) Avail: NTIS HC A08/MF A01 CSCL 09B

Development of qualification requirements, training programs, career plans, and methodologies for effective management and

training of inspection and enforcement personnel were studied. Task 5 required the development of an automated personnel data base system for NRC/IE. This system is identified as the NRC/IE Personnel, Assignment, Qualifications, and Training System (PAQTS). The documentation for PAQTS including the functional requirements document (FRD), the data requirements document (DRD), the hardware and software capabilities assessment, and the detailed implementation schedule are provided. GRA

N79-22795# Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Computer Science.
ERROR RECOVERY IN CAPABILITY SYSTEMS
William A. Wulf and Didier Lanciaux Jun. 1978 27 p refs
(Contract F44620-73-C-0074)
(AD-A064794; CMU-CS-78-127; AFOSR-79-0061TR) Avail: NTIS HC A03/MF A01 CSCL 09/2

Methodologies and checking techniques have been proposed to improve software reliability. It has also been argued that capability mechanisms are the natural support for these techniques because they enhance modular decomposition and information hiding. However, there is a conflict between these observations; modular decomposition limits the possible recovery actions to the information that a module can access directly. Each module must rely upon the reliability of those that it uses. This paper presents a mechanism which allows recovery to be managed at any level in this system while satisfying the information hiding principle. It is based on a save-restore mechanism. In addition, primitives to define consistent states in the system are provided by the Kernel. Author (GRA)

N79-22806# Carnegie-Mellon Univ., Pittsburgh, Pa. Management Sciences Research Group.
SIMPLE MODELS IN STOCHASTIC PRODUCTION PLANNING
Suresh P. Sethi (Toronto Univ.) and Gerald L. Thompson Jul. 1978 17 p refs Sponsored in part by Natl. Res. Council of Can.
(Contract N00014-75-C-0621)
(AD-A064346; MSRR-420; WP-3-78-79) Avail: NTIS HC A02/MF A01 CSCL 15/5

A simple stochastic production-inventory model with quadratic cost functions is analyzed in detail. The inventory process is assumed to be driven by a white noise process resulting into an Ito stochastic differential equation. Both finite and infinite horizon versions of the problem are treated by a methodology based on the theory of stochastic integrals and differentials. Particular attention is given to illustrate the methodology, which is quite general and capable of dealing with more complicated problems. The paper concludes with some remarks in connection with the relationship of the results of this paper to the results in the deterministic case. Author (GRA)

N79-22956# Harvard Univ., Cambridge, Mass. Div. of Applied Sciences.
RESOURCE MANAGEMENT IN LARGE SYSTEMS Ph.D. Thesis
Rajan Suri Dec. 1978 208 p refs
(Contract N00014-75-C-0648; Grant NSF ENG-76-11824)
(AD-A064780; TR-671) Avail: NTIS HC A10/MF A01 CSCL 05/1

This work studies the application of decentralization to the problem of Resource Management in Large Systems. In an operational system, where a very large number of activities share limited resources, this Resource Management problem has three objectives. The first ('Initial Allocation') is to find an assignment of resources to every activity, such that all the system constraints are satisfied, and all activities are operating. The second ('New-Assignment') is to find a rationale for allocating resources to new activities. New activities are initiated frequently enough that it is not desired to re-solve the entire problem for the combined set of old and new activities. The third objective ('Periodic Review') is to find an efficient way of re-allocating resources in order to reflect the changing needs of the individual activities, as well as the changes in total resource usages. Conventionally, the resource-allocation problem has been studied for the case where, in addition to the constraints, there exists an objective to be maximized. The emphasis, as is reflected by the title of this work, is on the feasibility aspect of the problem, that is, of taking a large system and keeping it operational. It is shown that this in itself is both an important problem, and has theoretically interesting consequences. In addition, the results can be useful for the solution of the general (optimization) problem. GRA

N79-22960*# National Aeronautics and Space Administration, Washington, D. C.
TECHNICAL PUBLICATIONS PROGRAM. A WORKING GUIDE
1979 18 p
(NASA-TM-80412) Avail: NTIS HC A02/MF A01 CSCL 05B

Many of the questions that arise during the day-to-day activities of NASA's agency-wide scientific and technical publication program are answered. This document provides information on the policies and procedures of the program. In addition to serving as a guide for NASA Headquarters and NASA field installation personnel, this publication may be referenced in NASA contract and grant instruments. L.S.

N79-22964# RAND Corp., Santa Monica, Calif.
AN APPRAISAL OF MODELS USED IN LIFE CYCLE COST ESTIMATION FOR USAF AIRCRAFT SYSTEMS Interim Report
Kenneth E. Marks, H. Garrison Massey, and Brent D. Bradley Oct. 1978 128 p
(Contract F49620-77-C-0023)
(AD-A064333; RAND/R-2287-AF) Avail: NTIS HC A07/MF A01 CSCL 14/1

Although life cycle analysis is widely used as a management tool, considerable uncertainty still exists about its effectiveness with respect to economic tradeoffs, funding decisions, and resource allocations. This report evaluates some of the most widely used life cycle cost (LCC) models: AFR 173-10 models (BACE AND CACE); the Logistics Support Cost Model; the Logistics Composite model; the MOD-METRIC model; AFM 26-3 Manpower Standards; Air Force Logistics Command Depot Maintenance Cost Equations; the DAPCA model; and the PRICE model. The models are rated within a framework incorporating a set of life cycle cost elements and a set of cost driving factors. Color-coded illustrations summarize the results. The models are shown to have many shortcomings that limit their usefulness for life cycle analyses in which estimates of absolute, incremental cost are required. Specific areas are identified where driving factor/cost element combinations are not adequately addressed.
Author (GRA)

N79-23822 Northwestern Univ., Evanston, Ill.
THE COMMERCIALIZATION OF COMPUTER SERVICES: A CASE STUDY IN THE USE OF MANAGEMENT SCIENCE Ph.D. Thesis
Gerald Morton Hoffman 1978 163 p
Avail: Univ. Microfilms Order No. 7907887

This is a study of the application of Management Science to an actual business problem: the selection of a portfolio of products with which to launch a new business venture, a computer services company. The venture is a diversification activity of a major industrial corporation: thus, its goals are somewhat different from those of most new businesses. The identification of these goals and the analysis performed in furtherance of them is the core of the study. It is a case study, and as such it encompasses more than the tidy structure of problem-model-solution: it includes substantial amounts of material about the context of the problem, the modeling process itself, and the uses of the model.
Dissert. Abstr.

N79-23823 Kansas State Univ., Manhattan.
A STUDY OF MULTIPLE OBJECTIVE DECISION MAKING: METHODS AND APPLICATIONS Ph.D. Thesis

Abu Syed Md. Masud 1978 362 p
Avail: Univ. Microfilms Order No. 7906788

The objectives of this research were: (1) to make a state-of-the-art survey of multiple objective decision making (MODM) methods and application, (2) to make a comparative study of some major MODM methods through their application to an aggregate production planning problem, (3) to apply Goal Programming (GP), one of the MODM methods, to an energy planning and allocation problem, (4) to introduce a new interactive MODM method, and (5) to apply GP and the new method to an economic development planning model for Bangladesh.
Dissert. Abstr.

N79-23824# Logistics Management Inst., Washington, D. C.
A UNIFORM PROFIT POLICY FOR GOVERNMENT ACQUISITION Final Report
Robert K. Wood, Myron G. Myers, and M. Brian McDonald Dec. 1978 174 p refs
(Contract MDA903-77-C-0370)
(AD-A066032; LMI-77-15-4) Avail: NTIS HC A08/MF A01 CSCL 15/5

This report presents a policy to enable the government to determine equitable profit objectives for use in contract negotiations. The need for such a policy was recognized in 1972 by the Commission on Government Procurement. It was noted then that current profit policies were non-uniform from agency to agency. Further, current policies are thought to discourage cost savings and there is no criterion by which to judge the adequacy of profits. Two principles are embodied in the uniform profit policy: (1) the policy should support the primary government acquisition goal of least overall cost to the government; and (2) the target profit rates should be derived from commercial rates and incorporate recent experience. The policy has two formulas: for contracts in the service sector of the economy, a profit formula based upon cost is applied; for contracts in the manufacturing and construction sectors, a profit formula based upon both cost and capital is used. The authors acknowledge that the recommended profit policy will not by itself ensure that contractors configure themselves most efficiently for government work. Many other government policies have influence. They believe that it will, however, increase recognition and reward for the functions of profit and alleviate impediments to savings and cost saving investment.
GRA

N79-23825# Center for Creative Leadership, Greensboro, N. C.
LOOKING GLASS, INCORPORATED OUTSIDE INFORMATION NOTEBOOK. VOLUME 5: OPERATIONAL MANUAL
Michael M. Lombardo, Morgan W. McCall, Jr., and David L. DeVries 1978 53 p
(Contract N00014-76-C-0870; NR Proj. 170-825)
(AD-A064769) Avail: NTIS HC A04/MF A01 CSCL 05/1

Looking Glass is a simulation of a glass manufacturing corporation. There are twenty positons, ranging across three divisions and four levels (Plant Manager, Director, Vice-President, and President). The divisions face different environments, ranging from volatile to stable. Looking Glass is, in a word, typical--the organizational type, structure and environments are common. All problems contained in the simulation are based on actual events. Volume V contains standarized responses to the most commonly asked questions during runs of Looking Glass. The responses are organized by division, and include responses for corporate level problems. Guidelines and procedures for the simulation controller explain how to respond to requests and how to record the responses.
GRA

N79-24195 Ohio State Univ., Columbus.
DEVELOPMENT AND IMPLEMENTATION OF PRODUCTIVITY MEASUREMENT SYSTEMS WITH EMPHASIS ON INTERORGANIZATION RELATIONSHIPS Ph.D. Thesis
David Scott Sink 1978 574 p
Avail: Univ. Microfilms Order No. 7908217

Emphasis is placed on development of productivity measurement and improvement systems as management or decision aids for organization/environment relationships. The methodology utilized to design and develop the systems incorporates action research concepts and application of structured group methods. The methodology was developed and tested during previous research in four major public sector organizations. The basic methodology was further expanded to incorporate considerations for implementation and organization/environment relationships. The expanded methodology was applied in six various organizations; two public school districts, one private sector manufacturing firm, one public sector small municipality, one medical educational consortium, and one home economics extension service organization. Approximately 130 persons participated in the application of this methodology. The results of these experiences are discussed and evaluated.
Dissert. Abstr.

N79-24249# General Accounting Office, Washington, D. C. Community and Economic Development Div.
DEVELOPING A DOMESTIC COMMON CARRIER TELECOMMUNICATIONS POLICY: WHAT ARE THE ISSUES
24 Jan. 1979 59 p
(PB-290787/1; CED-79-18) Avail: NTIS HC A04/MF A01 CSCL 17B

The issues studied by the Congress on the domestic carrier policy are presented. Included are: (1) what policy goals should the United States pursue; (2) what industry structure should supply common carrier services; and (3) can the present regulating methods be improved.
GRA

N79-24483# International Business Machines Corp., Huntsville, Ala.
SOLAR PROJECT COST REPORT: TERRELL E. MOSELEY OFFICE BUILDING, LYNCHBURG, VIRGINIA
17 May 1978 35 p
(Contracts W-31-109-eng-38; EG-77-C-01-4049)
(SOLAR/2011-78/60) Avail: NTIS HC A03/MF A01

The construction costs of a solar heating project in an office warehouse building are presented. Category costs are listed by materials, direct labor, and subcontract costs. The subcontract costs include both materials, labor, overhead and profit for mechanical and electrical subcontractors.
DOE

N79-24484# International Business Machines Corp., Huntsville, Ala.
SOLAR PROJECT COST REPORT: KALWALL CORPORATION WAREHOUSE, MANCHESTER, NEW HAMPSHIRE
31 May 1978 29 p
(Contracts W-31-109-eng-38; EG-77-C-01-4049)
(SOLAR/2015-78/60) Avail: NTIS HC A03/MF A01

The construction costs of this solar heating project are presented. Category costs are listed by materials, labor, and subcontract costs. The subcontract costs include both materials, labor overhead and profit for mechanical and electrical subcontractors.
DOE

N79-24494# International Business Machines Corp., Huntsville, Ala.
SOLAR PROJECT COST REPORT. IRIS IMAGES, INCORPORATED, FILM LABORATORY, MILL VALLEY, CALIFORNIA
9 Jun. 1978 33 p
(Contracts W-31-109-eng-38; FG-77-C-01-4049)
(SOLAR/2005-78/60) Avail: NTIS HC A03/MF A01

The solar energy system which provides preheated process water used for photographic film processing is described. The construction costs of this solar water heating project are presented. Categorical system costs are broken down into materials, direct labor, and subcontract costs where available.
DOE

N79-24665# National Research Inst. for Mathematical Sciences, Pretoria (South Africa).
COMPUTER RESOURCE PERFORMANCE MANAGEMENT A TOTAL DATA CENTRE APPROACH

E. N. vanDeventer and J. D. Roode Nov. 1978 45 p refs (CSIR-TWISK-54) Avail: NTIS HC A03/MF A01

A Computer Resource Performance Management (CRPM) system is based on a total data center approach and uses a management information data base to support four different but integrated management functions. The performance measurement management and tuning, performance data analysis, and resource performance management functions are discussed. The performance prediction and modelling function is described, which is based upon an operational analysis multiclass queuing network model results indicate that such an integrated CRPM system is an indispensable tool in the objective approach to computer installation management. S.E.S.

N79-24889# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

AN EXPLORATORY STUDY FOR DESIGN OF A PROPULSION DEPUTATE MANAGEMENT INFORMATION SYSTEM M.S. Thesis

Bruce E. Wallachy Sep. 1978 100 p refs (AD-A065883; AFIT/GSM/SM/78S-25) Avail: NTIS HC A05/MF A01 CSCL 05/1

The primary objective of this thesis effort is the development of a plan for the design and implementation of a management information system (MIS) in the Deputate for Propulsion. To accomplish the task the MIS development ideas and concepts presented by MIS experts in the literature sources are examined and applied to the organization and its work. Specific actions and agents are then identified for the MIS development. Since the development process for the Deputate is in its initial stages at the time of this thesis effort, special attention is paid to identifying actions which initially help orient the development toward a successful system. Author (GRA)

N79-24890# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

AN INVESTIGATION OF A HUMAN INFORMATION PROCESSING MODEL FOR DECISION MAKING M.S. Thesis

David R. Unger Sep. 1978 119 p refs (AD-A065912; AFIT/GSM/SM/78S-23) Avail: NTIS HC A06/MF A01 CSCL 05/10

This research examined information overload in decision makers by means of a human information processing model developed by Schroder, Driver, and Streufert. That model provided that the ability of an individual to integrate data into a decision varied in a curvilinear fashion with the complexity of the information environment. Information processing capacity was hypothesized to increase up to a certain optimum level and then decrease, marking the onset of information overload. A policy capturing exercise was employed to measure the amount of information processed for three different levels of information availability. Subjects were given sets of four, six, or eight national problem areas along with hypothetical priorities that the federal government was said to attach to those problems. The subjects indicated their levels of agreement or disagreement with each set of priorities. Regression analysis was then used to discover how many of the available problem areas contributed significantly to the three sets of decisions. The information utilization patterns were compared to the predictions of the model. GRA

N79-24891# North Carolina Univ., Chapel Hill. Dept. of City and Regional Planning.

PUBLIC PARTICIPATION IN 208 WATER QUALITY PLANNING: A CASE STUDY OF TRIANGLE J COUNCIL OF GOVERNMENTS, NORTH CAROLINA

Steven Herzberg Apr. 1978 72 p refs (Contract DI-14-34-0001-8035) (PB-290587/5; W79-03666; OWRT-A-096-NC(1)) Avail: NTIS HC A04/MF A01 CSCL 13B

The experience of participants in a completed regional water quality planning process is documented in order to offer guidance to the state-wide planning process currently underway in North Carolina. In addition to the case study, the various participation activities undertaken during preparation of the plan are described from state level advisory groups to local involvement in small area plans. The effectiveness of different methods of public participation during the stages of the planning process is compared. GRA

N79-24893# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

EVALUATION OF COMPUTER AIDED INDEXING OF INFORMATION FOR SUPPORT OF CONTRACT APPEALS M.S. Thesis

Ronald D. Vargo Sep. 1978 98 p refs (AD-A065835; AFIT/GSM/SM/78S-24) Avail: NTIS HC A05/MF A01 CSCL 09/2

The Air Force Directorate of Contract Appeals (AFLC/JAB) has encountered difficulty in managing information needed in case preparation. Problems with manual information systems overload and lack of attorney time prevented adequate representation for the Air Force before the Armed Services Board of Contract Appeals. Also, the conduct of an effective litigation presentation was difficult. In order to remedy this situation several pilot computer-based systems had been developed, but they needed to be tested against the requirements of the Directorate. This thesis consists of a study of the requirements and evaluations of the costs and benefits of two feasible equipment configurations. To accomplish the evaluations, the expected costs of both configurations is compared to the personnel costs that would be required to achieve the needed capabilities without the use of computer-based systems. Both the use of time sharing systems and the use of a dedicated minicomputer are found to be cost effective, but the procurement of a minicomputer-based word processing system is expected to lead to greater overall savings. The conclusions offered also include a suggested plan for system implementation and recommendations for additional research that can be accomplished. Author (GRA)

N79-24897 Southern Methodist Univ., Dallas, Tex.

MATHEMATICAL PROGRAMMING METHODS FOR URBAN TRANSPORTATION NETWORKS Ph.D. Thesis

Mustafa Fatih Sadek Abdulaal 1978 198 p Avail: Univ. Microfilms Order No. 7911216

Optimization based methods which can be embedded in the general transportation planning process are addressed. Models and solution techniques for combined modal split-equilibrium assignment problems and transportation network design problems are developed. A brief review of the existing models and basic techniques that are generally used in the process of transportation planning is presented. Different ways of combining modal split models and equilibrium assignment models into one multimodal equilibrium assignment model with variable modal splits are discussed. Dissert. Abstr.

N79-24900# Department of Energy, Washington, D. C. Transportation Energy Conservation Div.

ELECTRIC AND HYBRID VEHICLE PROGRAM Annual Report to Congress, fiscal year 1978

Jan. 1979 90 p refs (DOE/CS-0068; AR-2) Avail: NTIS HC A05/MF A01

The DOE Electric and Hybrid Vehicle Program has responsibility for accelerating the commercialization of electric and hybrid vehicles in the nation's transportation sector. The goal of the program is to assure the availability and broad market acceptance of vehicles that do not depend on petroleum as their principal energy source. The program management, demonstrations (P. L. 94-413 requirements), incentives, research and development, risk assessment, impact assessments, and environmental impact evaluation processes are discussed. DOE

N79-24903# Colorado State Univ., Fort Collins. Water Resources Research Inst.
DEVELOPMENT OF A DRAINAGE AND FLOOD CONTROL MANAGEMENT PROGRAM FOR URBANIZING COMMUNITIES, PART 1 Completion Report
Eugene J. Riordan, Neil S. Grigg (N. Carolina Univ.), and Robert L. Hiller Sep. 1978 67 p refs Sponsored in part by Urban Drainage and Flood Control District, Denver; and City of Lakewood, Colo. 2 Vol.
(Contract DI-14-34-0001-7112; OWRT Proj. B-161-COLO(5)-Pt-1)
(PB-290997/6; COMPLETION-85-Pt-1; W79-04109) Avail: NTIS HC A04/MF A01 CSCL 13B

A drainage management procedure for mitigating community development-induced drainage impacts is presented. The three major elements of a drainage management program are discussed: (1) the technical element establishes the method of flood hydrology calculation; (2) the financial element establishes methods for drainage and flood control cost calculation and cost allocation; and (3) the regulatory element establishes the enforcement mechanism of the drainage management program. The planning methodology for calculating project costs can reduce the front-end drainage planning cost by 75 to 80%. GRA

N79-24904# Colorado State Univ., Fort Collins. Water Resources Research Inst.
DEVELOPMENT OF A DRAINAGE AND FLOOD CONTROL MANAGEMENT PROGRAM FOR URBANIZING COMMUNITIES, PART 2 Completion Report
Eugene J. Riordan, Neil S. Grigg, and Robert L. Hiller Sep. 1978 227 p refs 2 Vol.
(Contract DI-14-34-0001-7112; OWRT Proj. B-161-COLO(5)-Pt-2)
(PB-290998/4; COMPLETION-86-Pt-2; W79-04110) Avail: NTIS HC A11/MF A01 CSCL 13B

The three major elements of a drainage control program directed towards mitigating community development generated induced drainage impacts of a recommended drainage management program are discussed Various hydrologic predictions used to evaluate development-induced drainage impacts are examined. Tha predictive capability of some rain-fall-runoff models is compared through a statstical analysis of published results from those models, and the sensitivity of project analysis to poor runoff prediction is evaluated. The financial aspect of a drainage management system is developed through a review of the legal issues concerning municipal and developer liability cost calculation, and cost apportionment. GRA

N79-24912# Environmental Protection Agency, Washington, D. C.
OFFICE OF RESEARCH AND DEVELOPMENT PROGRAM GUIDE, FISCAL YEAR 1979 Report, 1 Oct. 1978 - 30 Sep. 1979
Jan. 1979 84 p refs Prepared by JRB Associates, McLean, Va.
(Contract EPA-68-01-4839)
(PB-292003/1; EPA-600/9-79-002) Avail: NTIS HC A05/MF A01 CSCL 13B

The Program Guide provides the public with information on the Office of Research and Development's current extramural research program. It describes each of the major budget units, the funds associated with each, and the responsible laboratory (ies). In addition there are several indices which allow the user to refer to these units by media (air, water, etc.) function (health effects, control technology, etc.), or by a given laboratory's areas of responsibilities. GRA

N79-24978*# Douglas Aircraft Co., Inc., Long Beach, Calif.
CARGO LOGISTICS AIRLIFT SYSTEMS STUDY (CLASS). VOLUME 2: CASE STUDY APPROACH AND RESULTS
R. J. Burby and W. H. Kuhlman Oct. 1978 98 p Prepared in cooperation with Flying Tiger Line
(Contract NAS1-14948)
(NASA-CR-158913) Avail: NTIS HC A05/MF A01 CSCL 01C

Models of transportation mode decision making were developed. The user's view of the present and future air cargo systems is discussed. Issues summarized include: (1) organization of the distribution function; (2) mode choice decision making; (3) air freight system; and (4) the future of air freight. S.E.S.

N79-25117# Committee on Science and Technology (U. S. House).
NASA SPACE AND TERRESTRIAL APPLICATIONS, USER DEVELOPMENT ACTIVITIES
Washington GPO 1978 498 p refs Hearings before the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 95th Congr., 2d Sess., 27-29 Jun. 1978
(GPO-32-438) Avail: Subcomm. on Space Sci. and Applications

The remote sensing technology of NASA's earth monitoring programs is discussed as well as its transfer of activities to the commercial market place. M.M.M.

N79-25252# Forecasting International Ltd., Arlington, Va.
US ARMY METRICATION: ANALYSIS AND RECOMMENDATIONS FOR DA IMPLEMENTATION PLAN. VOLUME 2: ANNEXES
M. J. Cetron, L. A. Roepcke, C. F. McFadden, S. E. Sugarek, and E. B. Peters Jun. 1978 156 p
(Contract DAAG39-77-C-0108)
(AD-A066984) Avail: NTIS HC A08/MF A01 CSCL 14/2

Contents: U.S. Trade Statistics by Industry; Public Law 94-168--Metric Conversion Act of 1975; Statistical Data on U.S. Companies with Metrication Experience; ANMC Sector Conversion Plans--Highway vehicles, Electrical goods, Construction and agricultural equipment, and Instruments; DoD Directive 4120.18--Use of the metric system of measurement; AR 700-1--Army conversion to the metric system of measurement; RSI and International Activities; Training Programs; Impact of Metric Conversion on Army Logistics Functions; Guidelines for Monitoring U.S. Metric Progress; Impact of Metrication on Army Regulations; Project Manager's Checklist; and Recommended Changes to AR-700-1. GRA

N79-25407# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
METHODOLOGY FOR CONTROL OF LIFE CYCLE COSTS FOR AVIONICS SYSTEMS
Apr. 1979 150 p refs Lectures presented at Bonn, 7-8 May 1979 and Athens, 10-11 May 1979
(AGARD-LS-100; ISBN-92-835-1321-5) Avail: NTIS HC A07/MF A01

Various aspects of life cycle costs as relating to airborne equipment are presented. Included are: the model of a Canadian microtacan, research on the reliability of the systems, and methods for the control of the costs.

N79-25408# General Research Corp., Santa Barbara, Calif.
LIFE CYCLE COST ANALYSIS CONCEPTS AND PROCEDURES
Edward N. Dodson *In* AGARD Methodology for Control of Life Cycle Costs for Avionics Systems Apr. 1979 28 p refs

Avail: NTIS HC A07/MF A01

The principles and procedures of parametric cost analysis based upon aggregate relationships between cost and the physical/performance characteristics of high technology equipment are presented. M.M.M.

N79-25409# Bell-Northern Research Ltd., Ottawa (Ontario). Contract Reliability Engineering.
THE DEVELOPMENT AND IMPLEMENTATION OF LIFE CYCLE COST METHODOLOGY
T. D. Kiang *In* AGARD Methodology for Control of Life Cycle

Costs for Avionics Systems Apr. 1979 25 p refs

Avail: NTIS HC A07/MF A01

The concepts of the life cycle management and the life cycle costing process suitable for the Canadian Forces environments are presented. The features of the life cycle management cost model and its capability to relate cost and system effectiveness factors are discussed. The results of the model application to the AN/ARN-504 microtacan are presented. M.M.M.

N79-25411# Ministry of Defence, London (England).
PROBLEMS IN THE INVESTIGATION OF RELIABILITY-ASSOCIATED LIFE-CYCLE COSTS OF MILITARY AIRBORNE SYSTEMS
P. G. Reich *In* AGARD Methodology for Control of Life Cycle Costs for Avionics Systems Apr. 1979 21 p refs

Avail: NTIS HC A07/MF A01

The problems of deriving improved control of the life cycle costs that are associated with reliability are discussed as well as the relationships between the many possible sorts of investment resulting in better reliability and maintainability and the benefits it achieves. Considered are the difficulty in overcoming data acquisition, and the methodology for handling the complex properties of reliability and maintainability of airborne weapons systems. M.M.M.

N79-25537# Northwestern Univ., Evanston, Ill. Center for Interdisciplinary Study of Science and Technology.
CONTEXTUAL ANALYSIS FOR INDUSTRIAL ENERGY CONSERVATION R AND D Final Report
Michael Radnor and Durward Hofler Mar. 1978 355 p refs Sponsored by DOE
(Grant NSF PRA-76-SP-1311)
(PB-290981/0; NSF/PRA-76-SP-1311-F) Avail: NTIS HC A16/MF A01 CSCL 10A

The potential usefulness of an analytical technique developed for use by policy makers in a wide variety of R&D and innovation-related situations and sectors was assessed. Operational procedures for identifying critical factors important to program planning and project selection were developed. The technique is expected to be a useful supplement to conventional cost benefit analysis. GRA

N79-25800# George Washington Univ., Washington, D. C. Inst. for Management Science and Engineering.
COMPUTING EQUILIBRIA VIA NONCONVEX PROGRAMMING
Jonathan F. Bard and James E. Falk 10 Nov. 1978 42 p refs
(Grant DAAG29-76-G-0150)
(AD-A067188; Serial-T-386; ARO-13622.6-M) Avail: NTIS HC A03/MF A01 CSCL 12/1

The problem of determining a vector that places a system in a state of equilibrium is studied with the aid of mathematical programming. The approach derives from the logical equivalence between the general equilibrium problem and the complementarity problem. When the excess demand function g(x) meets certain separability conditions, equilibrium solutions are obtained by using an established branch and bound algorithm. Because the best upper bound is known at the outset, an independent check for convergence can be made at each iteration of the algorithm, thereby greatly increasing its efficiency. A number of examples drawn from economic and network theory are presented in order to demonstrate the computational aspects of the approach. The results appear promising for a wide range of problem sizes and types, with solutions occurring in a relatively small number of iterations. GRA

N79-25913*# Computer Sciences Corp., El Segundo, Calif.
WORK MANAGEMENT PLAN FOR DATA SYSTEMS AND ANALYSIS DIRECTORATE
Lee R. Nichols 1 May 1979 27 p
(Contract NAS9-15700)
(NASA-CR-160191; Rept-79-FD-011; JSC-14885) Avail: NTIS HC A03/MF A01 CSCL 05A

A contract with the Data Systems and Analysis Directorate contains a specified level of resources related to a specific set of work in support of three divisions within the Data Systems and Analysis Directorate. The divisions are Institutional Data Systems Division, Ground Data Systems Division, and Mission Planning and Analysis Division. The Statement of work defines at a functional requirements level the type of support to be provided to the three divisions. The contract provides for further technical direction to the contractor through issuance of Job Orders. The Job order is the prime method of further defining the work to be done, allocating a portion of the total resources in the contract to the defined tasks, and further delegating technical responsibility. G.Y.

N79-25914*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PLANNING AND MANAGING FUTURE SPACE FACILITY PROJECTS
Joan E. Sieber (California State Coll., Hayward), John A. Wilhelm (Texas Univ., Austin), Trieve A. Tanner, Robert L. Helmreich (Texas Univ., Austin), and Susan F. Burgenbauch (Texas Univ., Austin) May 1979 29 p refs
(NASA-TM-78586; A-7811) Avail: NTIS HC A03/MF A01 CSCL 05A

To learn how ground-based personnel of a space project plan and organize their work and how such planning and organizing relate to work outcomes, longitudinal study of the management and execution of the Space Lab Mission Development Test 3 (SMD 3) was performed at NASA Ames Research Center. A view of the problems likely to arise in organizations and some methods of coping with these problems are presented as well as the conclusions and recommendations that pertain strictly to SMD 3 management. Emphasis is placed on the broader context of future space facility projects and additional problems that may be anticipated. A model of management that may be used to facilitate problem solving and communication - management by objectives (MBO) is presented. Some problems of communication and emotion management that MBO does not address directly are considered. Models for promoting mature, constructive and satisfying emotional relationships among group members are discussed. A.R.H.

N79-25915*# Computer Sciences Corp., Houston, Tex. Applied Technology Div.
DESIGN SPECIFICATION, INTEGRATED PROCUREMENT MANAGEMENT SYSTEM, VERSION 2 (IPMS-2) ONLINE SUBSYSTEM, VOLUME 1
L. E. Ely Apr. 1979 184 p
(Contract NAS9-15700)
(NASA-CR-160248; JSC-14847) Avail: NTIS HC A09/MF A01 CSCL 05A

The design for the online subsystem is detailed. Input template design and processing logic for all pr, contract, and CCA forms used by the Procurement Operations Office are discussed.A.R.H.

N79-25916# Dayton Univ., Ohio. Research Inst.
FORCE MANAGEMENT METHODS. TASK 1 REPORT. CURRENT METHODS Interim Report, 26 Sep. 1977 - 25 Sep. 1978
Larry E. Clay, Ned. H. Sandlin, Douglas S. Morcock, K. E. Brown, and R. L. Johnson Dec. 1978 500 p refs
(Contract F33615-77-C-3122)
(AD-A066593; UDR-TR-78-85; AFFDL-TR-78-183) Avail: NTIS HC A21/MF A01 CSCL 01/3

A state-of-the-art survey was conducted as the initial phase of the preparation of a handbook of methods for accomplishing force management in accordance with the requirements of MIL-STD-1530A. This report presents the results of the survey and summarizes the information gathered from visits to 47 organizations and from a review of pertinent literature. In

particular, the current methods for accomplishing individual aircraft tracking loads/environment spectra surveys, and force structural maintenance planning are described. Those methods which satisfy MIL-STD-1530A requirements are recommended for inclusion in the handbook. Data collection and data processing methods are reviewed and compared in terms of accuracy and cost. The coordination of the major elements of force management is reviewed with emphasis on the organizational and data analysis interfaces. Specific force management data was collected on all major operational Air Force airplanes and a summary for each is also presented. Author (GRA)

N79-25917# Stanford Univ., Calif. Dept. of Computer Science.

A FRAMEWORK FOR CONTROL IN PRODUCTION SYSTEMS

Michael Georgeff Jan. 1979 38 p refs
(Contract MDA903-76-C-0266; ARPA Order 2494)
(AD-A066561; SU-STAN-CS-79-716; AIM-322) Avail: NTIS HC A04/MF A01 CSCL 09/2

A formal model for representing control in production systems is defined. The formalism allows control to be directly specified independently of the conflict resolution scheme, and thus allows the issues of control and nondeterminism to be treated separately. Unlike previous approaches, it allows control to be examined within a uniform and consistent framework. It is shown that the formalism provides a basis for implementing control constructs which, unlike existing schemes, retain all the properties desired of a knowledge based system -- modularity, flexibility, extensibility and explanatory capacity. Most importantly, it is shown that these properties are not a function of the lack of control constraints, but of the type of information allowed to establish these constraints. Within the formalism it is also possible to provide a meaningful notion of the power of control constructs. This enables the types of control required in production systems to be examined and the capacity of various schemes to meet these requirements to be determined. Schemes for improving system efficiency and resolving nondeterminism are examined, and devices for representing such meta-level knowledge are described. In particular, the objectification of control information is shown to provide a better paradigm for problem solving and for talking about problem solving. It is also shown that the notion of control provides a basis for a theory of transformation of production systems, and that this provides a uniform and consistent approach to problems involving subgoal protection. Author (GRA)

N79-25918# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.

PERCEIVED WORK EFFORT AS TIME DEVOTED TO AN ACTIVITY

John R. Turney and Stanley L. Cohen Sep. 1978 22 p refs
(DA Proj. 2Q1-62717-A-779; DA Proj. 2Q7-62722-A-765)
(AD-A062411; ARI-TP-337) Avail: NTIS HC A02/MF A01 CSCL 05/9

Work effort is one of the quantitative measures in organizational effectiveness programs, but little has been done to measure effort itself or its external indicators. This research explores the extent to which self-estimates of effort expended on specific activities are related to actual time spent. Self-estimates of the effort and amount of time spent on specific activities were collected from 31 soldiers in an information-processing facility. At the same time, a computer recorded the amount of time actually spent on each activity. Analysis of the data indicated that the perceptual measures of effort correlated significantly with actual durations across different activities and different measures of time. On the average, 25% of the variance in effort was accounted for by time. External indicators of work effort can measure either intensity or duration of expended effort. When external indicators of intensity are also developed, it should be possible to determine how adequately self-estimates of effort can be anchored in external reality by incorporating measures of both intensity and duration across a range of Army jobs and organizational settings. Author (GRA)

N79-25919# California Univ., Berkeley. Inst. of Transportation Studies.

TRANSPORTATION SYSTEM MANAGEMENT ACTIONS: IMPLICATIONS OF FLEXIBLE WORK HOURS Final Report, Sep. 1975 - Dec. 1977

David W. Jones, Takuya Nakamoto, and Matthys P. Cilliers Dec. 1978 66 p refs
(Contract DOT-OS-50237)
(PB-292448/8; UCB-ITS-RR-78-4;
DOT/RSPA/DPB-50/78/29) Avail: NTIS HC A04/MF A01 CSCL 13B

Strategies to reduce peaking in urban transportation through work rescheduling are an element of Transportation System Management. Most discussions of work schedule management focused on work staggering and the four-day week. The merit of flexible or variable work hours as a traffic management strategy is considered. It concludes that flextime is compatible with programs that seek to increase bus ridership and carpooling. Flextime appears promising as a strategy of congestion relief. A survey of almost 500 employees of a California State agency which recently adopted flexible work hours was made. An analysis of the peaking characteristics of travel to and from the San Francisco Central Business District are presented. GRA

N79-25920# California Univ., Berkeley. Inst. of Transportation Studies.

TRANSPORTATION SYSTEM MANAGEMENT: PROMISE, PERFORMANCE AND PROGNOSIS Final Summary Report, Sep. 1975 - Sep. 1977

David W. Jones, William L. Garrison, and Adolf D. May Dec. 1978 43 p refs
(Contract DOT-OS-50237)
(PB-292447/0; DOT/RSPA/DPB-50/78/30) Avail: NTIS HC A03/MF A01 CSCL 13B

An assessment of the efficiency of transportation system management (TSM) as both a strategy of transportation system improvement and a philosophy of planning administration was presented. The impetus for TSM and its roots in the recent history of transportation planning and finance was discussed. Conclusions about the efficacy of TSM planning were discussed and a model TSM planning process that responds to the conclusions reached was proposed. GRA

N79-25927# Committee on Commerce, Science, and Transportation (U. S. Senate).

NASA AUTHORIZATION FOR FISCAL YEAR 1980, PART 2

Washington GPO 1979 507 p refs Hearings on S. 357 before the Comm. on Commerce, Sci., and Transportation, 96th Congr., 1st Sess., 21-22 and 28 Feb. 1979
(GPO-43-135) Avail: Comm. on Commerce, Sci., and Transportation

Testimony delivered and statements received to justify NASA's budget requests to support program management, research and development, construction of facilities, and other activities are presented. Implications of the civilian space policy, capabilities of the space shuttle, and the status of its main engine are discussed as well as accomplishments in advanced programs related to power systems, space platforms and space transportation systems, and satellite services. A.R.H.

N79-25928# Logistics Management Inst., Washington, D. C.

IMPLEMENTATION OF NATO GUIDELINES ON INTELLECTUAL PROPERTY RIGHTS

David M. Conrad, Dwight E. Collins, Michael K. Masterson, and Mark C. Morse Jan. 1979 110 p refs Revised
(Contract MDA903-77-C-0370)
(AD-A066805; LMI-RE803-Rev) Avail: NTIS HC A06/MF A01 CSCL 05/1

Increased standardization and interoperability of NATO weapons is now a major goal of DoD. The success of the cooperative programs necessary to achieve this goal will in large measure depend on the extent to which defense industries in the United States and other NATO countries can agree to share their Intellectual Property (IP). IP covers a broad range of

technical knowledge and expertise, much of which companies consider to be private information that alone distinguishes them from their competitors. In early 1978, the Council of National Armaments Directors promulgated a set of guidelines for transfer of IP under NATO cooperative programs. LMI was asked to suggest actions that DoD could take to implement the guidelines and to make cooperative programs generally more attractive to industry. The guidelines require the United States and other NATO governments to be able to ensure transfer of IP among themselves and/or their designated contractors. In our view this requirement can best be satisfied not by the U.S. Government itself acquiring and transferring IP, but rather by international company-to-company transfers subject to Government oversight and review. This report recommends four actions that DoD, with the cooperation of other NATO countries, can take to facilitate IP transfers in NATO cooperative programs. GRA

N79-25929# Ecos, Inc., Boston, Mass.
COMMUNITY WATER MANAGEMENT, RESEARCH NEEDS FOR SMALL AND URBANIZING COMMUNITIES
David A. DelPorto May 1978 70 p refs
(Grant NSF 78-SP-0933)
(PB-291939/7; NSF/RA-780372) Avail: NTIS HC A04/MF A01 CSCL 13B

Various methods of approach in dealing with the water needs of small and urbanizing communities are outlined. Water quality issues, such as type of contamination and sources of pollution and historical perspectives of wastewater management, the re-definition and semantics of supply and demand, the conflict of environment vs. energy, and economic considerations are covered. GRA

N79-25934# Environmental Protection Agency, Washington, D. C. Facility Requirements Div.
MUNICIPAL WASTEWATER MANAGEMENT: PUBLIC ACTIVITIES GUIDE
Clem L. Rastatter, ed. (Conservation Foundation), John Hammond, and Larry McBennett Feb. 1979 126 p refs 2 Vol.
(PB-292393/6; EPA-430/9-79-005; FRD-7) Avail: NTIS HC A07/MF A01 CSCL 13B

A handbook is presented which was prepared for use in a training program to acquaint citizen leaders with the important decisions that are made in planning for the management of municipal wastewater. GRA

N79-25935# Environmental Protection Agency, Washington, D. C. Facility Requirements Div.
MUNICIPAL WASTEWATER MANAGEMENT: CITIZEN'S GUIDE TO FACILITY PLANNING
Clem L. Rastatter, ed. (Conservation Foundation), John Hammond, and Larry McBennett Jan. 1979 259 p refs 2 Vol.
(PB-292394/4; EPA-430/9-79-006) Avail: NTIS HC A12/MF A01 CSCL 13B

A handbook is presented which is organized around a logical progression of questions that the involved citizen or local governmental official is likely to encounter in trying to influence the municipal sewage facilities planning process. The Handbook reflects the latest federal regulations and policies, as of January 1979, and assumes a level of interest that is more than casual on the part of the reader. GRA

N79-25937# Comsis Corp., Wheaton, Md.
QUICK-RESPONSE URBAN TRAVEL ESTIMATION TECHNIQUES AND TRANSFERABLE PARAMETERS. USER'S GUIDE Final Report
Arthur B. Sosslau, Amin B. Hassam, Maurice M. Carter, and George V. Wickstrom Washington Transportation Research Board Sep. 1978 237 p refs Sponsored by DoT and American Association of State Highway and Transportation Officials
(PB-292037/9; TRB/NCHRP/REP-187; ISBN-0-309-02775-6; LC-78-66460) Avail: NTIS HC A11/MF A01 CSCL 13B

Manual techniques are presented for use in each aspect of travel demand estimation; i.e., trip generation, trip distribution, model choice, auto occupancy, time-of-day distribution, traffic assignment, capacity analysis, and development density versus highway spacing relationships. Numerous charts, tables, and nomographs are included to simplify each analysis step. Data requirements are also reduced by making maximum use of transferable parameters developed from other studies and urban areas. Three scenario applications of the manual techniques are included to illustrate the potential of the various analysis techniques. GRA

N79-25943# Delta Research Corp., Arlington, Va.
AN INTERNATIONAL STUDY OF ECONOMIC BENEFITS ATTRIBUTABLE TO R AND D, BY SOURCE AND SECTOR OF PERFORMANCE Final Report
Robert U. Ayres, Jordan Lewis, and Stephen D. Collier Jun. 1978 71 p refs
(Contract NBS-8-04299)
(PB-292783/8; NBS-GCR-ETIP-78/60) Avail: NTIS HC A04/MF A01 CSCL 05C

Evidence found in a study performed on the nature of the interrelationships between public and private research and development and economic performance is reported. The historical records of various countries are compared. GRA

N79-25945# Stanford Univ., Calif. Program in Infrastructure Planning and Management.
ENVIRONMENTAL CONSIDERATIONS IN THREE INFRASTRUCTURE PLANNING AGENCIES: AN OVERVIEW OF RESEARCH FINDINGS
Leonard Ortolano, Charles M. Brendecke, James E. Price, and John J. Meersman Dec. 1978 102 p refs
(Grant NSF PRA-75-22340)
(PB-292545/1; SU-IPM-6; NSF/PRA-7522340/1) Avail: NTIS HC A06/MF A01 CSCL 13B

Data from interviews with 118 planners and environmental specialists who played key roles in 68 water resources and highway planning investigations indicate that environmental information exerts a relatively strong influence on planning outcomes in studies where there is early and extensive coordination with other agencies and the public, and where environmental specialists function as active planners who communicate frequently and informally with engineering planners and who have duties including a broad range of activities rather than just activities that concern environmental impact assessment. GRA

N79-26491*# Barry (Theodore) and Associates, Los Angeles, Calif.
SAMICS VALIDATION. SAMICS SUPPORT STUDY, PHASE 3 Final Report
Mar. 1979 145 p refs Prepared for DOE and JPL
(Contracts NAS7-100; JPL-955123)
(NASA-CR-158746; DOE/JPL-955123-79/1; JPL-9950-100) Avail: NTIS HC A07/MF A01 CSCL 10A

SAMICS provides a consistent basis for estimating array costs and compares production technology costs. A review and a validation of the SAMICS model are reported. The review had the following purposes: (1) to test the computational validity of the computer model by comparison with preliminary hand calculations based on conventional cost estimating techniques; (2) to review and improve the accuracy of the cost relationships being used by the model: and (3) to provide an independent verification to users of the model's value in decision making for allocation of research and developement funds and for investment in manufacturing capacity. It is concluded that the SAMICS model is a flexible, accurate, and useful tool for managerial decision making. G.Y.

N79-26824 Stanford Univ., Calif.
PRODUCT DIFFERENTIATION IN COMPUTER SERVICES Ph.D. Thesis
Michal Gartenkraut 1979 173 p
Avail: Univ. Microfilms Order No. 7912362

Two equilibria are studied: the user equilibrium and the market equilibrium. A user equilibrium is obtained if, for a given fixed set of prices, no user has an incentive to change his choice of center or of quantity of service purchased. A method for determining user's choice in equilibrium is presented for the case where all services are (partial) substitutes. The solution method permits the study of the influence several factors have on user's choice. A method of solving the conditions for a market equilibrium is presented which enables one to analyze service survival and diversity, and the factors affecting them.
Dissert. Abstr.

N79-27002*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SCATS: SRB COST ACCOUNTING AND TRACKING SYSTEM HANDBOOK
Ross B. Zorv, Rodney D. Stewart, Gary Coley, and Marie Higginbotham Jun. 1978 42 p
(NASA-TM-78302) Avail: NTIS HC A02/MF A01 CSCL 05A

The Solid Rocket Booster Cost Accounting and Tracking System (SCATS) which is an automatic data processing system designed to keep a running account of the number, description, and estimated cost of Level 2, 3, and 4 changes is described. Although designed specifically for the Space Shuttle Solid Rocket Booster Program, the ADP system can be used for any other program that has a similar structure for recording, reporting, and summing numbers and costs of changes. The program stores the alpha-numeric designators for changes, government estimated costs, proposed costs, and negotiated value in a MIRADS (Marshall Information Retrieval and Display System) format which permits rapid access, manipulation, and reporting of current change status. Output reports listing all changes, totals of each level, and totals of all levels, can be derived for any calendar interval period. G.Y.

N79-27003# Pennsylvania Univ., Philadelphia. Wharton School of Finance.
MODEL MANAGEMENT SYSTEMS: A FRAMEWORK FOR DEVELOPMENT Technical Report, Jan. - Dec. 1979
Joyce J. Elam 12 Feb. 1979 28 p refs
(Contract N00014-75-C-0440)
(AD-A067246; Rept-79-02-04) Avail: NTIS HC A03/MF A01 CSCL 05/1

This paper presents an architecture for a generalized model management system that facilitates the integration of management science models into a decision support system. The objective of the system is to support the decision-maker both in specifying a problem and in effecting a solution. This is accomplished by providing him/her with a means for interacting with a complex structured database to specify the structure of some problem; and to solve the model defined for the problem using appropriate information -- either from the database or some other source -- and efficient solution procedures. Author (GRA)

N79-27004# Massachusetts Inst. of Tech., Cambridge. Operations Research Center.
A COMPARISON OF HEURISTIC METHODS USED IN HIERARCHICAL PRODUCTION PLANNING
Elizabeth A. Haas, Arnoldo C. Hax, and Roy E. Welsch Mar. 1979 34 p refs
(Contract N00014-75-C-0556)
(AD-A066932; TR-160) Avail: NTIS HC A03/MF A01 CSCL 12/2

Hierarchical planning systems support medium range planning decisions in a batch processing production environment. In this approach, higher level (tactical) decisions impose constraints on lower level (operational) actions. Several heuristic approaches to hierarchical production planning have been proposed in the management science literature. This paper compares, conceptually and empirically, four of these approaches. The paper begins by discussing the direct optimization approach, and its associated drawbacks. The second section briefly describes several approaches to the design of a hierarchical production planning system and the distinguishing characteristics of the resulting algorithms. The third section compares four different methodologies for disaggregating tactical plans in a hierarchical setting. The paper concludes with recommendations for specific approaches to disaggregation in differing production environments.
GRA

N79-27005# Tactical Air Command, Langley AFB, Va. Concepts Div.
A USER'S GUIDE FOR TAC PERT
Howard J. Talley, Jr. 12 Apr. 1979 50 p refs
(AD-A068012; TAC/XPB-TN-79-5) Avail: NTIS HC A03/MF A01 CSCL 09/2

This note documents the use of the Program Evaluation and Review Technique (PERT) to assist in the close management of large programs. This note includes a general description of PERT methodology, specific conventions used in adopting this methodology to TAC'S hardware and software, a description of the output products available and a discussion of utility and requirements of this tool in program management. The results are referred to as TAC PERT. Author (GRA)

N79-27006# Logistics Management Inst., Washington, D. C.
FINCAP ANALYSIS: A METHOD FOR FINANCIAL CAPABILITY ANALYSIS OF AIR FORCE CONTRACTORS
Josephus O. Parr, Robert O. Edmister, and M. Brian McDonald Mar. 1979 153 p refs
(Contract MDA903-77-C-0370)
(AD-A067998; LMI-AF714) Avail: NTIS HC A08/MF A01 CSCL 05/1

FINCAP Analysis is a method for evaluating the financial capability of major Air Force Contractors. It is designed for use by contracting personnel who may have only a limited financial analysis background. FINCAP Analysis results in a comprehensive evaluation of a contractor's present and expected future financial condition, including its capability to perform a new contract. For analysis ratios and projections, FINCAP Analysis uses the FINANDAS computer system previously developed by LMI for DoD use. The manual explains the analysis method in step-by-step instructions. Also included are lists of data sources, data collection forms, detailed report and briefing formats, and a financial evaluation checklist. Author (GRA)

N79-27007# Ohio State Univ., Columbus. Computer and Information Science Research Center.
INFORMATION FLOW AND ANALYSIS: THEORY SIMULATION, AND EXAMPLES. PART 1: BASIC THEORETICAL AND CONCEPTUAL DEVELOPMENT. PART 2: SIMULATION, EXAMPLES AND RESULTS
M. C. Yovits and Lawrence L. Rose Sep. 1978 84 p refs
(Grants NSF DSI-76-21949; NSF GN-41628)
(PB-293458/6; OSU-CISRC-TR-78-5-Pt-1;
OSU-CISRC-TR-78-5-Pt-2) Avail: NTIS HC A05/MF A01 CSCL 12B

Variables and parameters in the information flow process are examined. Relationships among these variables are established and the resulting theory is applied to practical situations. Models, both simulation and experimental, are developed to utilize and validate the theory. Specifically, quantitative definitions and relationships are developed for quantity of information, value of information, effectiveness of information, decision maker effectiveness, decision maker performance, and other terms. A flexible, sophisticated simulation model which permits the examination of the interrelationship between information and decision making for a wide variety of different situations is described. GRA

N79-27009# Committee on Governmental Affairs (U. S. Senate).
FEDERAL INFORMATION CENTERS ACT
Washington GPO 1978 19 p Rept. to accompany S. 3259 from the Comm. on Governmental Affairs, 95th Congr., 2d Sess., 22 Aug. 1978
(S-Rept-95-1129; GPO-32-715) Avail: US Capitol, Senate Document Room

The Committee on Governmental Affairs to which was referred the bill (S. 3259) a bill to authorize the establishment of Federal information centers, having considered the same, reports favorably thereon without amendment and recommends that the bill do pass. S.3259 is to establish legislative authority for a national system of Federal information centers. Federal information centers provide direct help to citizens with questions about Federal Government services, progams and regulations. The Federal Information Centers Act authorizes the Adminstrator of the General Services Administration (GSA) to establish a nationwide network of Federal information centers. The Administrator is further authorized to prescribe necessary regulations for managing the information centers. G.Y.

N79-27022 Colorado State Univ., Fort Collins.
DEVELOPMENT OF A DRAINAGE WITH FLOOD CONTROL MANAGEMENT SYSTEM FOR URBANIZING COMMUNITIES Ph.D. Thesis
Eugene Joseph Riordan 1978 231 p
Avail: Univ. Microfilms Order No. 7913832

Uncertainties are clarified and a readily implementable drainage and flood control management system for the mitigation of development-induced drainage impacts is developed. The objectives are realized through a detailed examination of and recommendation on the three major elements of a drainage management system: the technical element which establishes the method of flood hydrology calculation, the financial element which establishes the methods for drainage and flood control cost calculation and cost allocation, and the regulatory element which establishes the enforcement mechanism of the drainage management program. Dissert. Abstr.

N79-27030# Patent and Trademark Office, Washington, D. C. Office of Technology Assessment and Forecast.
TECHNOLOGY ASSESSMENT AND FORECAST REPORT
Dec. 1977 191 p
(PB-293380/2) Avail: NTIS HC A09/MF A01 CSCL 05B

In order to stimulate and enhance the use and usability of the classified patent search file which contains twenty two million technological documents, and to assemble, analyze and make available meaningful data about the file, the Patent and Trademark Office compiled a master data base covering all U.S. patents which it periodically updates. The data base is used in the preparation as well as periodically issued general distribution publications in the preparation of special reports, tailored to individual needs. These reports, which are provided on a cost reimbursable basis are utilized by other government agencies and a number of private sector organizations. GRA

N79-27036# SRI International Corp., Menlo Park, Calif.
MANAGEMENT OF FEDERAL R AND D FOR COMMERCIALIZATION: EXECUTIVE SUMMARY
Norman B. McEachron, Harold S. Javitz, Donald S. Green, John D. Logsdon, and Egils Milbergs Sep. 1978 19 p 3 Vol.
(Contract NBS-5-35889)
(PB-292851/3; NBS-GCR-ETIP-78-57) Avail: NTIS HC A02/MF A01; also available in set of 3 reports HC E08 as PB-292850-SET CSCL 05A

Commercial acceptability of Federal research and development is considered along with technical success. Specific topics discussed include current policies and practices of Federal agencies regarding the management of Federally funded research and development and recommendations for policies and practices that would improve the commercialization of Federally funded research and development results. GRA

N79-27037# SRI International Corp., Menlo Park, Calif.
MANAGEMENT OF FEDERAL R AND D FOR COMMERCIALIZATION Final Report
Norman B. McEachron, Harold S. Javitz, Donald S. Green, John D. Logsdon, and Egils Milbergs Sep. 1978 143 p refs 3 Vol.
(Contract NBS-5-35889)
(PB-292852/1; NBS-GCR-ETIP-78-58) Avail: NTIS HC A07/MF A01; also available in set of 3 reports HC E08 as PB-292850-SET CSCL 05A

Management of Federally funded research and development programs intended for non-Federal application is considered. Emphasis is placed on commercial acceptability of research and development results. GRA

N79-27038# SRI International Corp., Menlo Park, Calif.
MANAGEMENT OF FEDERAL R AND D FOR COMMERCIALIZATION: APPENDICES: SUPPORTING DOCUMENTATION
Norman B. McEachron, Harold S. Javitz, Donald S. Green, John D. Logsdon, and Egils Milbergs Dec. 1978 175 p 3 Vol.
(Contract NBS-5-35889)
(PB-292853/9; NBS-GCR-ETIP-78-58A) Avail: NTIS HC A08/MF A01; also available in set of 3 reports HC E08 as PB-292850-SET CSCL 05A

An empirical investigation of Federal/civilian research and development management practices is documented. Planning, developing, and implementing research and development programs whose results are intended for commercialization by the non-Federal private sector are emphasized. GRA

N79-27062# Technical Research Centre of Finland, Espoo.
[ACTIVITIES OF THE TECHNICAL RESEARCH CENTER OF FINLAND] Annual Report, 1977
1978 36 p
Avail: NTIS HC A02/MF A01

Organization, budget, present activities, and programs are briefly reviewed. The main divisions of the research center are building technology and community development, materials and processing technology, and electrical and nuclear technology.
Author (ESA)

N79-27112*# Douglas Aircraft Co., Inc., Long Beach, Calif.
CARGO LOGISTICS AIRLIFT SYSTEMS STUDY (CLASS). VOLUME 3: CROSS IMPACT BETWEEN THE 1990 MARKET AND THE AIR PHYSICAL DISTRIBUTION SYSTEMS, BOOK 1
R. J. Burby and W. H. Kuhlman Oct. 1978 383 p
(Contract NAS1-14948)
(NASA-CR-158914) Avail: NTIS HC A17/MF A01 CSCL 01C

The interrelations between the infrastructure and the forecast future market are discussed. Also, using forecasts of market growth for a base, future aircraft and air service concepts were evaluated.

N79-27113*# Douglas Aircraft Co., Inc., Long Beach, Calif.
THE 1990 SYSTEM CHARACTERISTICS AND REQUIREMENTS
In its Cargo Logistics Airlift Systems Study (CLASS), Vol. 3 Oct. 1978 p 1-64

Avail: NTIS HC A17/MF A01 CSCL 01C

Potential future developments that may occur in the air, truck, rail, and sea transportation industries were identified. Technological and operational developments were qualitatively evaluated for their potential effect upon the vehicle and institutional characteristics of the respective modes. Also identified were the multiplicity of cross impacts that must be considered when viewing air cargo as an integrated transport system. R.E.S.

N79-27114*# Douglas Aircraft Co., Inc., Long Beach, Calif.
AIRFREIGHT FORECASTING METHODOLOGY AND RESULTS
In its Cargo Logistics Airlift Systems Study (CLASS), Vol. 3 Oct. 1978 p 65-132

Avail: NTIS HC A17/MF A01 CSCL 01C

A series of econometric behavioral equations was developed to explain and forecast the evolution of airfreight traffic demand for the total U.S. domestic airfreight system, the total U.S.

international airfreight system, and the total scheduled international cargo traffic carried by the top 44 foreign airlines. The basic explanatory variables used in these macromodels were the real gross national products of the countries involved and a measure of relative transportation costs. The results of the econometric analysis reveal that the models explain more than 99 percent of the historical evolution of freight traffic. The long term traffic forecasts generated with these models are based on scenarios of the likely economic outlook in the United States and 31 major foreign countries. R.E.S.

N79-27115*# Douglas Aircraft Co., Inc., Long Beach, Calif.
THE 1990 DIRECT SUPPORT INFRASTRUCTURE
In its Cargo Logistics Airlift Systems Study (CLASS), Vol. 3 Oct. 1978 p 133-351

Avail: NTIS HC A17/MF A01 CSCL 01C

The airport and cargo terminal were individually analyzed in depth as the principal direct infrastructure components having cross impacts with aircraft carrying cargo. Containerization was also addressed in depth as an infrastructure component since it categorically is linked with and cross impacted by the aircraft, the cargo terminal, the surface transport system, the shipper and consignee, and the actual cargo being moved. R.E.S.

N79-27117# Mitre Corp., McLean, Va.
DEFINITION, DESCRIPTION, AND INTERFACES OF THE FAA'S DEVELOPMENTAL PROGRAMS. VOLUME 1: OVERVIEW Final Report
F. S. Keblawi Sep. 1978 146 p
(Contract DOT-FA79WA-4184)
(AD-A068226; FAA-EM-78-16; MTR-7904-Vol-1) Avail: NTIS HC A07/MF A01 CSCL 17/7

An overview is presented of the evolution of the air traffic control system facilities as major system improvements currently being developed by the FAA are implemented. The description was prepared to assist the FAA with the technical planning for the future air traffic control system. The major domestic air traffic control facilitity classifications are described. R.E.S.

N79-27118# Mitre Corp., McLean, Va. Metrek Div.
DEFINITION, DESCRIPTION, AND INTERFACES OF THE FAA'S DEVELOPMENTAL PROGRAMS. VOLUME 2: ATC FACILITIES AND INTERFACES Final Report
P. O. Dodge, T. R. Simpson, W. F. Potter, G. G. Beeker, H. P. Guerber, J. C. Fowlkes, and F. S. Keblawi Sep. 1978 436 p refs
(Contract DOT-FA79WA-4184)
(AD-A068401; MTR-7904-Vol-2; FAA-EM-78-16-2-Vol-2) Avail: NTIS HC A19/MF A01 CSCL 17/7

The evolution of the air traffic control system facilities is described. Major system improvements currently being developed by the FAA are also described. Information flow between facilities is emphasized. R.E.S.

N79-27133# Arinc Research Corp., Annapolis, Md.
F-16 RELIABILITY IMPROVEMENT WARRANTY. IMPLEMENTATION AND MANAGEMENT PLAN
Apr. 1979 95 p
(Contract F33657-78-C-0156)
(AD-A068561; Rept-1713-01-5-1902) Avail: NTIS HC A05/MF A01 CSCL 15/5

The purpose of the Implementation and Management Plan is to provide a complete and comprehensive document that describes the multiple features of the F-16 RIW program, defines the responsibilities for meeting the contractual provisions of the program, identifies the responsible participants, and establishes the procedures and interfaces required for its successful implementation and management. The objective of the IMP is to assist the MFP users in introducing the F-16 RIW items into their inventories with minimum disruption to existing logistic support procedures. GRA

N79-27524# Naval Postgraduate School, Monterey, Calif.
RELIABILITY CONTROL MODEL FOR STORED ITEMS REQUIRING REWORK M.S. Thesis
Paulo Antonio Ferreira Dec. 1978 117 p refs
(AD-A067560) Avail: NTIS HC A06/MF A01 CSCL 12/2

An application of control theory to an administrative problem is given for the case of a system of stored items which are periodically reworked to improve their reliability. Expressions are developed for the final value of the reliability when the system is stable and the limits of stability are found. A Kalman filter is used in the control model to obtain an estimation of the item reliability when there are random errors in the measurement and in the rework process. An extension is done for more than one dimension for systems composed of subsystems in series, parallel or a combination of both. A procedure for an optimal sequence of levels of rework is found in the sense of optimizing a linear combination of several performance measures. Numerical examples are presented to demonstrate the use of the several expressions. Author (GRA)

N79-27880# Maryland Univ., College Park. Dept. of Computer Science.
INVESTIGATING SOFTWARE DEVELOPMENT APPROACHES Interim Report
Victor R. Basil and Robert W. Reiter, Jr. Aug. 1978 117 p refs
(Grant AF-AFOSR-3181-77)
(AD-A068742; TR-688; SEL-2; AFOSR-79-0540TR) Avail: NTIS HC A06/MF A01 CSCL 09/2

This paper reports on research comparing various approaches, or methodologies, for software development. The study focuses on the quantitative analysis of the application of certain methodologies in an experimental environment, in order to further understand their effects and better demonstrate their advantages in a controlled environment. A series of statistical experiments were conducted comparing programming teams that used a disciplined methodology (consisting of top-down design, process design language usage, structured programming, code reading, and chief programmer team organization) with programming teams and individual programmers that employed ad hoc approaches. Specific details of the experimental setting, the investigative approach (used to plan, execute, and analyze the experiments), and some of the results of the experiments are discussed. GRA

N79-27921# Brookhaven National Lab., Upton, N. Y.
ALTERNATIVE, SEMI-AUTOMATED METHOD FOR PERFORMING MULTIOBJECTIVE ANALYSES
J. Schank Aug. 1978 99 p refs
(Contract EY-76-C-02-0016)
(BNL-50892) Avail: NTIS HC A05/MF A01

An automated methodology to characterize the quality of an energy system was developed. Both the previous and automated procedures are executed upon variants of the 1985 and 2000 National Energy Plan scenarios and the respective results are compared. DOE

N79-28045*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
THE EFFECTS OF CONTEXT ON MULTIDIMENSIONAL SPATIAL COGNITIVE MODELS Ph.D. Thesis - Arizona Univ.
Edwin G. Dupnick May 1979 229 p refs
(NASA-TM-58219; JSC-14902) Avail: NTIS HC A11/MF A01 CSCL 05A

Spatial cognitive models obtained by multidimensional scaling represent cognitive structure by defining alternatives as points in a coordinate space based on relevant dimensions such that interstimulus dissimilarities perceived by the individual correspond to distances between the respective alternatives. The dependence of spatial models on the context of the judgments required of the individual was investigated. Context, which is defined as a perceptual interpretation and cognitive understanding of a judgment situation, was analyzed and classified with respect to

five characteristics: physical environment, social environment, task definition, individual perspective, and temporal setting. Four experiments designed to produce changes in the characteristics of context and to test the effects of these changes upon individual cognitive spaces are described with focus on experiment design, objectives, statistical analysis, results, and conclusions. The hypothesis is advanced that an individual can be characterized as having a master cognitive space for a set of alternatives. When the context changes, the individual appears to change the dimension weights to give a new spatial configuration. Factor analysis was used in the interpretation and labeling of cognitive space dimensions. A.R.H.

N79-28046# Texas Univ. at Austin. Center for Cybernetic Studies.
A BI-EXTREMAL PRINCIPLE FOR ESTIMATING EFFICIENCY FRONTIER PARAMETER VALUES
A. Charnes, W. W. Cooper, and A. P. Schinnar Mar. 1979 16 p refs
(Contracts N00014-75-C-0616; N00014-75-C-0569; N00014-76-C-0932; Grant NSF SOC-76-15876)
(AD-A068992; CCS-329) Avail: NTIS HC A02/MF A01 CSCL 12/2

A new approach is supplied for evaluating the efficiency of decision making units, locating efficiency frontiers and estimating parameters from observational data. This is accomplished by means of a nonlinear-nonconvex bi-extremal principle which is subsequently shown to be essentially reducible to a finite sequence of linear programming problems. The development is illustrated by means of multiple output functions which are piecewise of Cobb-Douglas or general log linear type and which also allow for increasing, decreasing and constant returns to scale. The reduction of the bi-extremal principle to linear programming equivalence is also accomplished for much more general classes of functions. GRA

N79-28047# Naval Postgraduate School, Monterey, Calif.
FEASIBILITY STUDY OF A COMPUTERIZED MANAGEMENT INFORMATION SYSTEM FOR THE NOAA CORPS PERSONNEL SYSTEM M.S. Thesis
Alan D. Anderson Dec. 1978 153 p refs
(AD-A068578) Avail: NTIS HC A08/MF A01 CSCL 05/1

The National Oceanic and Atmospheric Administration (NOAA) Commissioned Personnel Division was in the situation of being subject to increasing demands for information and services and having a fixed number of office personnel to fulfill those demands. A study was performed to investigate the feasibility of converting some aspects of the manual data handling procedures to computerized handling. Objectives were defined as: reducing data retrieval and information preparation time; increasing currency of data; aiding in monitoring suspense dates; eliminating some hard copy records; and improving information dissemination. A generalized computer system using a data base management system software package was designed. Alternatives for obtaining the requisite capabilities were evaluated and an implementation procedure was outlined. It was concluded that the automation of the system was feasible and would most likely result in increased effectiveness. GRA

N79-28048# Forschungsinstitut fuer Anthropotechnik, Meckenheim (West Germany).
DECISION MAKING AND PROBLEM SOLVING WITH COMPUTER ASSISTANCE [ENTSCHEIDEN UND PROBLEMLOESEN MIT RECHNERUNTERSTUETZUNG]
K.-F. Kraiss Feb. 1978 73 p refs In GERMAN; ENGLISH summary
(FB-36) Avail: NTIS HC A04/MF A01; Forschungs Inst. fuer Anthropotech., Meckenheim, West Ger. DM 10

In modern guidance and control systems the human as manager, supervisor, decision maker, problem solver, and trouble shooter often has to cope with a marginal mental workload. To improve this situation, computers should be used to relieve the operator of mental stress. This should be done not solely through increased automation, but through a reasonable sharing of tasks in a human computer team, whereby the computer supports the human intelligence. Recent developments in this area are summarized. It is shown that interactive support between operator and computer is feasible during information evaluation, decision making, and problem solving. The applied artificial intelligence algorithms comprehend pattern recognition and classifications, and machine learning as well as dynamic and heuristic programming. Elementary examples are presented to explain basic principles. Consequences for the layout of future man-machine systems, resulting from cooperation between human and artifical intelligence are discussed. Author (ESA)

N79-28057# Committee on Appropriations (U. S. Senate).
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, INDEPENDENT AGENCIES APPROPRIATION BILL, 1980
Washington GPO 1979 107 p refs Rept. to accompany H.R. 4394 for Comm. on Appropriations, 96th Congr., 1st Sess., 24 Jul. 1979
(S-Rept-96-258) Avail: US Capitol, Senate Document Room

Appropriations for the Department of Housing and Urban Development, and for sundry independent agencies, boards, commisions, corporations, and offices for the fiscal year ending September 30, 1980, and for other purposes were reported. The Nasa Budget estimate was approved while making some additions and reductions. This enables NASA to start some programs which were turned down by the Office of Management and Budget for inclusion in this year's request. M.M.M.

N79-28763# Battelle Pacific Northwest Labs., Richland, Wash.
HELIOSTAT MANUFACTURING ANALYSIS
Kirk Drumheller 1 Oct. 1978 155 p refs
(Contract EY-76-C-06-1830)
(PNL-2757) Avail: NTIS HC A08/MF A01

The manufacturing analysis provided materials, labor, equipment, and facility costs for each step in the manufacturing process. Detailed procedures are presented for cost estimates. These include estimating worksheets for each component of the manufacturing costs. DOE

N79-28765# Northeast Solar Energy Center, Cambridge, Mass.
BARRIERS AND INCENTIVES TO SOLAR ENERGY DEVELOPMENT. AN ANALYSIS OF LEGAL AND INSTITUTIONAL ISSUES IN THE NORTHEAST
Arnold R. Wallenstein Dec. 1978 115 p
(Contract EM-78-C-01-4274)
(NESEC-1) Avail: NTIS HC A06/MF A01

The legal and institutional barriers and incentives to commercializing alternate energy sources are analyzed with particular emphasis on solar energy. The laws that constitute either legal barriers or possible incentives in the commercializing of solar energy in the nine states served by the Northeast Solar Energy Center are detailed. Each barrier or incentive is briefly described in conceptual terms and then each issue area is analyzed in detail, within the context of the law of the nine states in the region. An analysis is given of Federal patterns of spending and subsidy. The section also addresses life-cycle costing, the problem of obtaining loans and insurance, DOE patent regulation issues, and briefly describes potential Federal and state financial sources for solar energy development. Laws in the nine-state region that address product and tort liability, warranty protection, consumer credit, consumer protection, trade and business regulation statutes, and equipment certification and product standards problems are discussed. Zoning, land use, sun and wind access, and building codes and inspection problems are included. Public utility regulations, state energy solar office enabling legislation, and labor jurisdiction questions are covered. DOE

N79-28890# Computer Corp. of America, Cambridge, Mass.
A DISTRIBUTED DATABASE MANAGEMENT SYSTEM FOR COMMAND AND CONTROL APPLICATIONS Semiannual Technical Report, 1 Jul. - 31 Dec. 1978
30 Jan. 1979 152 p refs

(Contract N00039-77-C-0074)
(AD-A068161; CCA-79-12; SATR-4) Avail: NTIS HC A08/MF A01 CSCL 09/2

The primary focus of this project is to design and implement a distributed database management system called SDD-1 (System for Distributed Databases). SDD-1 is specifically oriented toward command and control applications and will be installed and tested in the Advanced Command and Control Architectural Testbed at the Naval Ocean Systems Center in San Diego. SDD-1 is a system for managing databases whose storage is distributed over a network of computers. Functionally, SDD-1 provides the same capabilities that one expects of any modern database management system, and users interact with it precisely as if it were not distributed. Systems like SDD-1 are appropriate for applications which exhibit two characteristics: (1) the activity requires an integrated database -- i.e. the activity entails access to a single pool of information by multiple persons, organizations, or programs; and (2) either the users of the information or its sources are distributed geographically. Military command and control exhibits these two characteristics. GRA

N79-28926# Air Force Weapons Lab., Kirtland AFB, N. Mex.
SAIL, AN AUTOMATED APPROACH TO SOFTWARE DEVELOPMENT AND MANAGEMENT Final Report
Lewis P. Gaby, II, David C. Graham, and Clifford E. Rhoades, Jr. Jan. 1979 102 p refs
(AD-A068519; AD-E200258; AFWL-TR-78-80) Avail: NTIS HC A06/MF A01 CSCL 09/2

SAIL is a software development and management aid which provides a basis for disciplined design, programming, maintenance, and execution of computer programs. The system achieves a new level of centralized software development and maintenance control, while simultaneously decentralizing applications, providing controlled task specialization at compile time, and realizing portability between dissimilar machines. The system encourages economy by reducing duplication of effort often found when many versions of a basic source code are required. The system achieves efficient hardware utilization by providing source code which is specialized at execution time for the task. Except for a few machine dependent statements, SAIL is written in ANSI (66) FORTRAN IV. The system is currently operating on CDC, IBM, and Honeywell computers. GRA

N79-29091 Ohio State Univ., Columbus.
CONSIDERATIONS IN THE DESIGN OF PERFORMANCE MEASUREMENT SYSTEMS FOR INDEPENDENT RESEARCH ORGANIZATIONS Ph.D. Thesis
Joseph West Ray 1979 177 p
Avail: Univ. Microfilms Order No. 7916018

Relationships between performance measurement and performance were investigated to identify and develop considerations relevant to the design of business performance measurement systems (PMS) for independent research organizations. The research was based on a model which postulated two links between performance measurement and performance: a behavioral link involving organizational climate as an intervening variable, and a technical link reflecting the use of performance measurements as the basis for business decisions which in turn affect organizational performance. Dissert. Abstr.

N79-29092# National Science Foundation, Washington, D. C. Div. of Science Resources Studies.
NATIONAL PATTERNS OF R AND D RESOURCES: FUNDS AND PERSONNEL IN THE UNITED STATES, 1953-1978-1979
Oct. 1978 56 p refs
(PB-293847/0; NSF-78-313) Avail: NTIS HC A04/MF A01 CSCL 05A

Data are presented on the dollar volume of research and development performed within each sector of the economy; sources of financing; number of R and D Scientists and engineers; international comparisons; and other economic characteristics of the nation's R and D effort. GRA

N79-29093# National Science Foundation, Washington, D. C. Government Studies Group.
AN ANALYSIS OF FEDERAL R AND D FUNDING BY FUNCTION, FISCAL YEARS 1969 - 1979 Final Report, 1969 - 1979
Dec. 1978 80 p refs
(PB-293880/1; NSF-78-320) Avail: NTIS HC A05/MF A01 CSCL 05A

A total of 439 programs and program areas are identified and classified within the function structure by the primary purpose of the program. The absolute and relative amounts directed to each area are shown, and the current distribution is compared with earlier distributions to show changes in priorities. The chief function areas in the 1979 budget were national defense, space, health, and energy development and conversion. The first three of these were the leading functions throughout the 1969-79 period. The areas scheduled for chief growth in the 1979 budget were defense and space. The other areas taken together showed only 3-percent growth. The report includes the effects of later congressional appropriation actions, which resulted in increases in health, energy, and food and slight reductions for defense and space. GRA

N79-29094# General Accounting Office, Washington, D. C. Community and Economic Development Div.
NATIONAL BUREAU OF STANDARDS: INFORMATION AND OBSERVATIONS ON ITS ADMINISTRATION
21 Mar. 1979 80 p
(PB-293747/2; CED-79-29) Avail: NTIS HC A05/MF A01 CSCL 05A

Information and observations on more important aspects of how the National Bureau of Standards is administered are provided. It also explains some complexities of a major scientific organization. The Senate Committee on Commerce, Science and Transportation and its Subcommittee on Science, Technology and Space were concerned about persistent reports of a decline in the Bureau's scientific capabilities and its ability to adequately respond to specific congressional assignments. The committees saw the need for a critical review of the bureau's organic act and for possibly updating this statute in light of the Bureau's evolving role as a national laboratory. GRA

N79-29104# Committee of Conference (U. S. Congress).
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, FISCAL YEAR 1980
Washington GPO 1979 9 p Conference rept. to accompany H.R. 1786 from the Comm. of Conference, 96th Congr., 1st Sess., 20 Jul. 1979
(H-Rept-96-371; GPO-39-006) Avail: US Congress, House Document Room

The committee of conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill (H.R. 1786) to authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes, agreed to recommend that the House recede from its disagreement to the amendment of the Senate and agree to the same with an amendment. An amendment insert is presented which lists NASA programs and their funding allocations to be appropriated and made available October 1, 1979. G.Y.

N79-29105# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1980, VOLUME 1, PART 2
Washington GPO 1979 427 p refs Hearing on H.R. 1786 before the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 6 Feb. 1979
(GPO-46-134) Avail: Comm. on Sci. and Technol.

The President's budget for NASA is reviewed in the light of his civilian space policy and its impact on NASA programs. Major activities of FY 1980 highlighted include the space transportation system, space sciences, space and terrestrial

applications, aeronautics and space technology, space tracking and data systems, construction of facilities, research and program management, and international programs. The budget request is considered to comprise a sound, balanced aeronautics and space program, given the constraints of the national anti-inflational effort. It supports the continued development of the space transportation system, meets commitments made in the past, maintains progress in ongoing programs, and provides for flexibility in future programs. A.R.H.

N79-29182# Dynamics Research Corp., Wilmington, Mass.
DIGITAL AVIONICS INFORMATION SYSTEM (DAIS): RELIABILITY AND MAINTAINABILITY MODEL USERS GUIDE, VOLUME 2 Final Report, May 1975 - Jul. 1977
Andrew J. Czuchry, Robert H. Kistler, John M. Glasier, and Marjorie A. Bristol Apr. 1979 139 p
(Contract F33615-75-C-5218; AF Proj. 2051)
(AD-A068826; AFHRL-TR-78-2(2)) Avail: NTIS HC A07/MF A01 CSCL 14/4

The digital avionics information system (DAIS) life cycle cost (LCC) study provides the Air Force with an enhanced inhouse capability to incorporate LCC considerations during all stages of the system acquisition process. This report documents a reliability and maintainability (R & M) model developed in the study and also serves as a users manual. The R & M model, a training model, and a cost model comprise the DAIS LCC impact model (LCCIM) designed for use in LCC analysis of avionics systems. In this context, its primary function is to manipulate input data banks to produce intermediate products, figures of merit, and outputs required by the training and cost models. When used in a stand-alone mode, the R & M model provides a means for analyzing the R M impact of changes in system design and maintenance concepts on system support requirements. GRA

N79-29657# Brookhaven National Lab., Upton, N. Y. Policy Analysis Div.
SYSTEMS APPROACH TO ENERGY PLANNING
Philip F. Palmedo and Robert Nathans 18 Nov. 1978 21 p refs Presented at Caribbean Consultation on Energy and Agr., Santo Domingo, 1 Dec. 1978
(Contract EY-76-C-02-0016)
(BNL-25523; Conf-781226-1) Avail: NTIS HC A02/MF A01

The criteria of successful energy planning and ways to go about such planning are outlined. Economic, social, and political factors are discussed along with a wide range of geographical scales, from the household and village to the world scene. A reduced reliance on oil imports is emphasized. DOE

N79-29662# Logistics Management Inst., Washington, D. C.
INTERNATIONAL ENERGY EVALUATION SYSTEM. VOLUME 1: EXECUTIVE SUMMARY
M. L. Shaw and M. J. Hutzler Mar. 1977 43 p ref
(Contract EC-77-C-01-8602)
(HCP/I8602-01/1) Avail: NTIS HC A03/MF A01

The following topics are discussed: the energy forecasting problem in general; the international energy evaluation system (IEES) forecasting method and how it is distinguished from other international energy forecasting systems; the major components of IEES; and the principal applications of IEES. IEES provides alternatives forecasts of energy prices, supplies, demands, and conversion activities. DOE

N79-29790 Michigan Univ., Ann Arbor.
ISOMETRIC STRENGTH TESTING IN SELECTING WORKERS FOR STRENUOUS JOBS Ph.D. Thesis
William Monroe Keyserling 1979 224 p
Avail: Univ. Microfilms Order No. 7916744

Research was conducted to determine if strength testing can be used to reduce occupational illness and injuries which result from a mismatch between the strength abilities of workers and the strength demands of their jobs. To accomplish this, two field studies were performed in industrial plants. It was concluded that strength testing can be used to identify workers who would be at increased risk of suffereing a medical incident if placed on jobs with strength demands above their strength abilities. Dissert. Abstr.

N79-30081# General Services Administration, Washington, D.C.
MANAGEMENT GUIDANCE FOR DEVELOPING AND INSTALLING AN ADP PERFORMANCE MANAGEMENT PROGRAM
Nov. 1978 263 p refs
Avail: NTIS MF A01; SOD HC

A program to improve management and enhance control of the Automatic Data Processing (ADP) function is described. G.Y.

N79-30082# Decisions and Designs, Inc., McLean, Va.
DECISION ANALYSIS AS AN ELEMENT IN AN OPERATIONAL DECISION AIDING SYSTEM, PHASE 5 Final Technical Report, 15 Aug. 1977 - 14 Aug. 1978
Scott Barclay Apr. 1979 56 p refs
(Contract N00014-77-C-0595)
(AD-A068339; PR-78-29-6) Avail: NTIS HC A04/MF A01 CSCL 15/7

This report describes Phase V efforts in the continuing investigation of the theoretical foundations of the decision-analytic model developed for the Office of Naval Research's Operational Decision Aiding Project. The principal issue under consideration was the degree to which the utilization of an incomplete, simple hierarchical model in the Tactical Decision Aid (TACAID) could lead to errors in inference as compared with a more complex Bayesian hierarachical model. Specifically, the more complex model would be designed to make allowances for data dependencies as well as nonstationarity in enemy intent. It was concluded that a simple model can lead to significant and potentially costly errors in inference, and that TACAID should be modified to handle these additional complexities. Concurrent with such modifications, training in the proper use of the more complex TACAID would be mandatory to ensure proper use of the additional capabilities. As part of the current research and developement effort, a situation definition capability, called TACDEF, was implemented for TACAID. GRA

N79-30083# General Accounting Office, Washington, D. C. Community and Economic Development Div.
NATIONAL BUREAU OF STANDARDS NEEDS BETTER MANAGEMENT OF ITS COMPUTER RESOURCES TO IMPROVE PROGRAM EFFECTIVENESS
17 Apr. 1979 68 p refs
(PB-294066/6; CED-79-39) Avail: NTIS HC A04/MF A01 CSCL 05A

Planning, management, and use of computer resources is discussed. Improved computer resources for scientists and administrators greater efforts in requirements studies to demonstrate the need for added computer capabilities and management controls over hardware and software are recommended for program effectiveness along with an effective management system, centralizing computer management and increasing top management involvement. GRA

N79-30093# Committee on Commerce, Science, and Transportation (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1980, PART 3
Washington GPO 1979 558 p refs Hearings on S. 357 before the Comm. on Commerce, Sci., and Transportation, 96th Congr., 1st Sess., 2, 14-15 Mar.; 1 May and 4 Jun. 1979
(GPO-44-885) Avail: Comm. on Commerce, Sci., and Transportation

Testimonies, primarily from NASA (National Aeronautics and Space Administration) witnesses, before the Committee on Commerce, Science, and Transportation (United States Senate) are documented. The hearing was held to authorize appropriations to NASA for research and development, construction of facilities, research and program management, and for other purposes for FY-80. G.Y.

N79-30095 International Institute for Applied Systems Analysis, Laxenburg (Austria).
SYSTEMS ASSESSMENT OF NEW TECHNOLOGY: INTERNATIONAL PERSPECTIVES
G. M. Dobrov, ed., R. H. Randolph, ed., and W. D. Rauch, ed. Aug. 1978 100 p refs Presented at IIASA Workshop, Laxenburg, Austria, 18-22 Jul. 1977
(IIASA-CP-78-8) Avail: Issuing Activity

Several aspects of Technology Assessment (TA) and Systems Assessment of New Technology (SANT) are discussed in terms of international cooperation.

N79-30096 International Institute for Applied Systems Analysis, Laxenburg (Austria).
TOWARD EFFECTIVE INTERNATIONAL TECHNOLOGY ASSESSMENTS
K. Chen and L. Zacher *In its* Systems Assessment of New Technol. Intern. Perspectives Aug. 1978 p 1-12 refs

Avail: Issuing Activity

Technology assessments are defined as policy oriented systematic studies of the social impacts and the social management of science and technology. The importance of international cooperation in this field is discussed. The contextual dimension of TA is explained, a crossnational comparison example is analyzed, and an agenda for future work is presented. Author (ESA)

N79-30099 International Institute for Applied Systems Analysis, Laxenburg (Austria).
EXPERIENCE IN MULTINATIONAL FORECASTING OF ADVANCES IN SCIENCE AND TECHNOLOGY
V. Glushkov, G. M. Dobrov, V. Maksimenko, and Y. Ershov *In its* Systems Assessment of New Technol. Intern. Perspectives Aug. 1979 p 45-60 refs

Avail: Issuing Activity

A review of work done by member countries in the Council for Mutual Economic Assistance (CMEA) in the area of scientific and technological forecasting is presented. Author (ESA)

N79-30116# American Association for the Advancement of Science, Washington, D.C. Office of Public Sector Programs.
COMMUNITY AND ECONOMIC DEVELOPMENT
1979 187 p refs Presented at the Workshop Considering Probl. Identified by the Intergovernmental Sci., Eng., and Technol. Advisory Panel, 16-18 Nov. 1978, Elkridge, Md.
(Grant NSF OPA-78-24464)
(PB-294593/9; NSF/RA-790042) Avail: NTIS HC A09/MF A01 CSCL 13B

State and local growth and adjustment patterns, neighborhood development and stability, and central city business development are discussed. The problem areas are described in terms of problem statement and problem restatement by the planning group. GRA

N79-30422*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
TECHNICAL ASSISTANCE FOR LAW-ENFORCEMENT COMMUNICATIONS: CASE STUDY REPORT
Norman B. Reilly and James A. Mustain 15 Jun. 1979 21 p refs Sponsored in part by Law Enforcement Assistance Admin.
(Contract NAS7-100)
(NASA-CR-162108; JPL-Pub-79-71; Rept-1) Avail: NTIS HC A02/MF A01 CSCL 17B

Methods developed to improve police communications systems are described. Use of queueing analysis shows several ways of improving time of response to inquiries made from the field for license plate checks and for information on current wants and warrants, through a state multiple switcher network. Design criteria for more efficient centralized switching equipment are developed. A message load problem experienced in a dispatch center is analyzed, showing that communications could be improved by adding communications channels, not by adding people. K.L.

N79-30713# Hittman Associates, Inc., Columbia, Md.
COMPREHENSIVE COMMUNITY ENERGY PLANNING. VOLUME 2: APPENDICES
Nov. 1978 229 p refs 2 Vol.
(Contract EC-77-C-10-0023)
(HCP/M0023-02-Vol-2) Avail: NTIS HC A11/MF A01

Energy saving strategies and components for energy conservation in cities and residential areas are presented. Estimates for alternative energy saving measures are discussed in areas of land use, mass transit, and building modifications. Energy conservation plans in these areas, such as tax credits and loans, are discussed and estimation methods are described. A.W.H.

N79-30722# Hittman Associates, Inc., Columbia, Md.
COMPREHENSIVE COMMUNITY ENERGY PLANNING. VOLUME 1: A WORKBOOK
Nov. 1978 147 p refs 2 Vol.
(Contract EC-77-C-10-0023)
(HCP/M0023-01-Vol-1) Avail: NTIS HC A07/MF A01

The project resulted in the development of a methodology and workbook which enables community officials and staff to develop and evaluate energy conservation programs for their community. This methodology is a pioneering effort in the field of community energy planning. As such, many of the procedures generated were not subjected to test and evaluation in actual communities. In an effort to validate the procedures presented, the U.S. DOE is sponsoring a test and demonstration of this methodology in various selected communities. Based upon the results of these demonstrations, the procedures may require refinement to more accurately reflect actual community needs. G.Y.

N79-30796# Logistics Management Inst., Washington, D. C.
INTERNATIONAL ENERGY EVALUATION SYSTEM. VOLUME 2: TECHNICAL DOCUMENTATION, SEPTEMBER 1, 1978
M. L. Shaw and B. J. Allen Mar. 1979 277 p
(Contract EC-77-C-01-8602)
(HCP/L8602-01/2) Avail: NTIS HC A13/MF A01

A model was developed to analyze the impact of various national and international policies on energy flows between the U.S. and the rest of the world. This model forecasts equilibrium levels and prices for a typical day in 1985 and 1990. The modeling structure and its objectives are described. The demand for energy in the U.S., the other Organization for Economic Cooperation and Development countries, and the non-OECD regions-each of which is analyzed using different modeling approaches are discussed. The supply of primary energy materials, their transportation to consuming regions, and their conversion to final demand products are examined. The mathematical formulation of the problem and how the supply, transportation, conversion, and demand activities are combined to produce an equilibrium is presented. DOE

N79-30809# TRW, Inc., McLean, Va. Energy Systems Planning Div.
METHODOLOGY FOR THE ANALYSIS OF INVESTMENT ALTERNATIVES TO STIMULATE DEVELOPMENT AND TECHNOLOGY TRANSFER FOR ENERGY TECHNOLOGIES
Sep. 1978 27 p refs
(Contract ET-78-C-05-5670)
(TID-28971) Avail: NTIS HC A03/MF A01

The incentives to encourage the development and commercialization of selected energy technologies are examined through a final model. A decision oriented approach was adopted in characterizing a typical company's response to implementation of a particular incentive. This approach is described in detail. A computer model that calculates net present values and internal

rates of return for prescribed investments in manufacturing facilities is included. DOE

N79-30858# Harvard Univ., Cambridge, Mass. Landscape Architecture Research Office.
THE INTERACTION BETWEEN URBANIZATION AND LAND: QUALITY AND QUANTITY IN ENVIRONMENTAL PLANNING AND DESIGN. THE PUBLIC FISCAL ACCOUNTING MODEL
John Kirlin and H. James Brown Jan. 1979 56 p refs
(Grant NSF ENV-72-03372)
(PB-294620/0; NSF/RA-780435) Avail: NTIS HC A04/MF A01 CSCL 05A

The public fiscal accounting model estimates the required municipal property tax rate needed to balance a town's budget at the end of a five-year development period. The model is designed to handle several successive five-year allocation periods. The accounting model receives estimates of annual operating expenditures from the public expenditures model. The output from the model includes descriptions of expenditures, revenues, tax base, and tax rates. GRA

N79-30955# National Bureau of Standards, Washington, D. C. Inst. for Computer Sciences and Technology.
GUIDE TO TECHNICAL SERVICES AND INFORMATION SOURCES FOR ADP MANAGERS AND USERS
Shirley M. Radack Apr. 1979 51 p refs
(PB-294845/3; NBSIR-79-1734) Avail: NTIS HC A04/MF A01 CSCL 09B

Technical services and resources available to Federal ADP managers and users from other agencies in the U.S. Government are described. The names, addresses and telephone numbers of the agencies providing computer-related services and information are included. Subject areas covered include ADP standards, reports, management, performance evaluation, training, magnetic media, software, security and technical assistance. Information about Federal Information Processing Standards, Federal Standards for data communications, OMB policy guidance for ADP, procurement regulations and GSA regional services is reported. Federally sponsored ADP users' groups are listed. Sources are given for the documents and publications are cited. GRA

N79-31065 Pittsburgh Univ., Pa.
A CONTINGENCY MODEL OF ASSESSMENT OF IMPACT OF FLEXI-TIME INSTALLATION Ph.D. Thesis
Vadake Kurupath Narayanan 1978 205 p
Avail: Univ. Microfilms Order No. 7917404

A field experiment was designed to assess the impact of flexi-time installation, in a large division of a multinational corporation. At the individual level, moderating effects were hypothesized on flexibility, work climate and productivity due to (1) environmental factors--car pool membership and distance from work; (2) hierarchic level; and (3) socio-technical variables-back up, degree of cross-training, job satisfaction and social belongingness. The results strongly support moderating effects due to hierarchic level, social belonging and job satisfaction. At the organizational level, absenteeism decreased while productivity did not change. It is proposed that future research in organizational change should include influences due to moderating variables. Dissert. Abstr.

N79-31066*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DATA BASE MANAGEMENT SYSTEMS PANEL WORKSHOP: EXECUTIVE SUMMARY
1 Aug. 1979 18 p Workshop held at Pasadena, Calif., 5-7 Mar. 1979
(Contract NAS7-100)
(NASA-CR-162105; JPL-Pub-79-70) Avail: NTIS HC A02/MF A01 CSCL 05A

Data base management systems (DBMS) for space acquired and associated data are discussed. The full range of DBMS needs is covered including acquiring, managing, storing, archiving, accessing and dissemination of data for an application. Existing bottlenecks in DBMS operations, expected developments in the field of remote sensing, communications, and computer science are discussed, and an overview of existing conditions and expected problems is presented. The requirements for a proposed spatial information system and characteristics of a comprehensive browse facility for earth observations applications are included. A.W.H.

N79-31067# Decision Focus, Inc., Palo Alto, Calif.
RESOURCE-ALLOCATION METHODOLOGY FOR ESTABLISHING RD AND D BUDGETARY PRIORITIES
D. W. Boyd, D. W. North, and S. G. Regulinski Feb. 1978 178 p refs
(Contract ET-78-C-05-5474)
(ORO-5474-T1) Avail: NTIS HC A09/MF A01

The R, D and D resource-allocation methodology is designed for use by the Assistant Secretary, Energy Technology, in establishing budgetary priorities. It defines a logical process for developing a portfolio of programs consistent with policy goals of the Assistant Secretary, the complexities of the energy marketplace, and the departmental resource constraints. The methodology has two important components: a set of analytic procedures and a process for communicating information. Both of these aspects are necessary if the methodology is to be successfully implemented. Thus, it is the combination of these two aspects that provides the logical decision process that can cope with the complexities of choosing a portfolio of programs. DOE

N79-31068# Environmental Research Center, Cincinnati, Ohio.
HANDBOOK FOR PREPARING OFFICE OF RESEARCH AND DEVELOPMENT REPORTS
Dec. 1978 40 p Revised
(PB-294363/7; EPA-600/9-78-032) Avail: NTIS HC A03/MF A01 CSCL 05B

The essential specifications set forth by the Office of Research and Development (ORD) to ensure that the results and conclusions of its various research, development, and demonstration programs are documented and printed in a uniform, high quality, and cost-effective manner. It is specifically intended to assist those individuals responsible for preparing ORD scientific and technical reports by providing consistent format specifications and guidelines for the actual preparation of camera-ready reports. GRA

N79-31069# Marley Organization, Inc., Ridgefield, Conn.
PRINCIPAL ASPECTS OF US LABORATORY ACCREDITATION PROGRAMS
Charles W. Hyer 24 Jan. 1979 73 p
(Contract C-8-16656)
(PB-293463/6) Avail: NTIS HC A04/MF A01 CSCL 05A

The summaries covered in the areas of Federal government, state and local government, and professional and trade associations, include 56 programs. Information covered includes date established, type and scope of the program, authority for the program, funding and fees, fields of testing, standards and accreditation criteria employed, frequency and extent of laboratory assessment, appeal procedures, extent of proficiency testing required, the number of laboratories in the program, and the extent of international recognition. For each program a person has been identified who can process an application or is in other ways knowledgeable about the nature and content of the program. GRA

N79-31070# Commerce Dept., Washington, D.C. Office of Product Standards.
SUMMARY OF PROCEEDINGS, 2ND INTERNATIONAL CONFERENCE ON RECOGNITION OF NATIONAL PROGRAMS FOR ACCREDITATION TESTING LABORATORIES, ILAC/78
Oct. 1978 25 p Conf. held at Washington, D. C., 23-27 Oct. 1978
(PB-294269/6) Avail: NTIS HC A02/MF A01 CSCL 14B

The presentations made at the Conference and the actions taken by the Conference are briefly summarized. The Task Force 1 report covered the relationships between ILAC and ISO certification problems. The Task Force 2 report covered the legal problems which may affect parcipitation by nations in any international arrangement for reciprocal recognition of national accreditation programs or schemes. The Task Force 3 report covered a proposed international directory of laboratory accrediting organizations. The Conference acknowledged the work of these Task Forces and created three new Task Forces to extend their work. GRA

N79-31071# Moshman Associates, Inc., Bethesda, Md.
FEDERALLY FUNDED RESEARCH AND DEVELOPMENT AT UNIVERSITIES AND COLLEGES: A DISTRIBUTIONAL ANALYSIS, VOLUME 1 Final Report
George J. Nozicka Feb. 1979 175 p refs 2 Vol.
(Grant NSF SRS-77-20867)
(PB-294008/8) Avail: NTIS HC A08/MF A01 CSCL 05A

Universities with doctoral programs in the sciences and engineering are heavily concentrated with the top quartile of schools accounting for three-quarters of all federally funded R&D expenditures. The distribution of non-Federal funds closely parallels the Federal distribution. No significant difference was found in the distribution of both Federal and non-Federal funds, between fields considered to be capital intensive and those not considered to be so. The distributional patterns of NSF research grant proposals were also analyzed and show that the concentration patterns of Federal support for academic R&D activities reflects the existing stratification of the research system in academia. GRA

N79-31072# Moshman Associates, Inc., Bethesda, Md.
FEDERALLY FUNDED RESEARCH AND DEVELOPMENT AT UNIVERSITIES AND COLLEGES: A DISTRIBUTIONAL ANALYSIS. VOLUME 2: APPENDICES Final Report
George J. Nozicka Feb. 1979 76 p 2 Vol.
(Grant NSF SRS-77-20867)
(PB-294009/6) Avail: NTIS HC A05/MF A01 CSCL 05A

Tables which contain the data used to establish the analytical findings are presented. GRA

N79-31079*# National Aeronautics and Space Administration, Washington, D. C.
PETITIONS FOR PATENT WAIVERS
Dec. 1978 103 p
(NASA-TM-80507; PB-289615/7; NHB-5500.1A-CH14) Avail: NTIS HC A06/MF A01 CSCL 05B

A supplement is presented to a previous publication which sets forth the findings of fact and recommendations of the NASA inventions and contributions board concerning selected petitions for waiver of rights by the United States to inventions made or that may be made in the performance of work under contracts with the National Aeronautics and Space Administration, as determined by the administrator. Lists of those petitions for which findings of fact are not digested in this publication, and of those on which action were deferred by the board, are included. GRA

N79-31081# Capital Systems Group, Rockville, Md.
IMPROVING THE DISSEMINATION OF SCIENTIFIC AND TECHNICAL INFORMATION: A PRACTITIONER'S GUIDE Final Report, 1974 - 1978
John M. Strawhorn, Elizabeth C. Fake, and Brigitte D. Huybrechts Nov. 1978 269 p refs Revised
(Contract NSF C-DSI-74-24410)
(PB-296536/6; NSF/IST-74/24410/14) Avail: NTIS HC A12/MF A01 CSCL 05B

Concepts, procedures, and technologies used to make scientific and technical publishing more effective and economical are presented. Innovations and improvements in conventional, journal, and monographic publishing print-on-paper alternatives to conventional publishing, and non print and mixed media innovations are described. 'Trends and prospects', 'innovations needed', and 'technology overviews', as well as a glossary and a list of suggested sources of additional information are included. GRA

N79-31084# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1980, VOLUME 1, PART 3
Washington GPO 1979 610 p refs Hearings on H.R. 1786 before the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 9-14 Feb. 1979
(GPO-46-422) Avail: Subcomm. on Space Sci. and Applications

Testimony received from personnel at the Kennedy, Johnson, and Marshall Centers as well as at the National Space Technology Laboratories and the Michoud 'facility' is presented. The President's budget plan for the Office of Space Science is discussed with implications for life sciences, planetary explorations, and physics and astronomy programs. Cooperative ventures with the European Space Agency are reviewed. A.R.H.

N79-31085# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1980, VOLUME 1, PART 4
Washington GPO 1979 760 p refs Hearings on H.R. 1756 before the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 15, 21-22, 28 Feb., 9, 12 Mar. 1979
(GPO-46-423) Avail: Subcomm. on Space Sci. and Applications

Budget requests for NASA's Office of Space Transportation are justified with emphasis on the supplemental request for space shuttle appropriations. Space applications programs related to using space as a relay point, for Earth observation, and to exploit its specific characteristics are dicussed as well as the satellite conversion and transmission of energy to Earth. Field hearings at Rockwell International and Lockheed are included. A.R.H.

N79-31086# Patent and Trademark Office, Washington, D. C.
TECHNOLOGY ASSESSMENT AND FORECAST
Mar. 1979 190 p refs
(Rept-9) Avail: NTIS HC A09/MF A01

The most active domestic and foreign patent technologies are ranked and trends are noted. Patent activities in ferrous metal technologies are analyzed and specific processes and innovations are described. Appropriate technology for transfer to small businesses and developing nations is discussed. Tabular data shows the dates of U.S. patents granted and patented applications for 113 of the most patent active corporations and their subsidaries (1969-1977) period. A.R.H.

N79-31096# Mitre Corp., McLean, Va.
AUTOMATED GUIDEWAY TRANSIT TECHNICAL DATA
A. Chambliss Apr. 1979 124 p Prepared for Urban Mass Transportation Admin.
(PB-295095/4; UMTA-VA-06-0041-79-4) Avail: NTIS HC A06/MF A01 CSCL 13F

Background data for general management-level discussions of Automated Guideway Transit (AGT) programs, systems, and other urban transportation modes are provided. Data are presented on general system characteristics, cost, energy, and environmental issues for AGT, rapid rail, light rail, and transit bus systems. In addition, a summary of 19 Downtown People Mover (DPM) proposals is provided. Raw data and assumptions are supplied in an appendix to provide a base for additional study. GRA

N79-31100# Georgia Inst. of Tech., Atlanta.
SINGLE-COMMODITY AND MULTI-COMMODITY NETWORK IMPROVEMENT PROCEDURES
Michael A. Mullens and Gunter P. Sharp Mar. 1979 289 p refs

(Contract DOT-OST-80050)
(PB-295482/4; DOT-OST-80050-1C) Avail: NTIS HC A13/MF A01 CSCL 13B

A multi-modal freight transport improvement problem is formulated, and a heuristic solution procedure is developed for large scale problems. Arcs on a multi-modal network are modified to minimize the sum of investment and shipper disutility. The modal includes a mode abstract multinomial logit model and convex arc transport characteristic improvement functions. The procedure is extended to include multiple transport commodity classes. GRA

N79-31108# Houston Univ., Tex. Coll. of Business Administration.
TECHNICAL INFORMATION FLOWS AND INNOVATION PROCESSES, EXECUTIVE SUMMARY Final Report
Robert T. Keller and Winford E. Holland Oct. 1978 5 p
(Grant NSF PRA-76-18441)
(PB-294925/3; NSF/PRA-7618441/1) Avail: NTIS HC A02/MF A01 CSCL 05A

The types of boundary-spanning activity needed to effectively transfer scientific and technological information to achieve innovation were examined as well as the personal characteristics and traits associated with effective boundary spanners. It also identified selection and training managerial strategies for improving scientific and technological information communication. One industrial R&D organization and two governmental R&D organizations provided a sample of 256 professional employees for the study. It was concluded that scientific and technological information boundary-spanning activity are most related to innovativeness and effective boundary spanners tend to have a low need for clarity and a high innovation orientation. GRA

N79-31109# Houston Univ., Tex. Coll. of Business Administration.
TECHNICAL INFORMATION FLOWS AND INNOVATION PROCESSES Final Report
Robert T. Keller and Winford E. Holland Oct. 1978 150 p refs
(Grant NSF PRA-76-18441)
(PB-294400/7; NSF/PRA-7618441/2) Avail: NTIS HC A07/MF A01 CSCL 05J

Data were collected from three separate sources: peer nominations, management ratings, and self-report questionnaires. It was concluded that scientific and technological information boundary-spanning activity are most related to innovativeness and that effective boundary spanners tend to have a low need for clarity and a high innovation orientation. GRA

N79-31205# Arinc Research Corp., Annapolis, Md.
RELIABILITY IMPROVEMENT WARRANTY TERMS AND CONDITIONS FOR THE INTEGRATED AVIONICS CONTROL SYSTEMS (IACS) Final Report, Jan. - Mar. 1979
Larry Cox May 1979 44 p
(Contract DAAB07-78-A-6606)
(AD-A069454; Rept-1573-01-1-1927) Avail: NTIS HC A03/MF A01 CSCL 01/3

The Advanced Systems Division of the U.S. Army Avionics Research and Development Activity at Fort Monmouth, New Jersey, has issued Engineering Development (ED) contracts to two contractors for the Integrated Avionics Control System (IACS). One of the features of the ED progam will be a complete logistics support analysis (LSA) of Reliability Improvement Warranty (RIW) as an alternative to Army organic support. ARINC Research Corportion assisted the IACS Project Office in the development of draft RIW terms and conditions on which the LSA will be based. This report presents the activities that were performed and describes the draft RIW and conditions that were developed. GRA

N79-31256# Committee on Science and Technology (U. S. House).
OVERSIGHT: SPACE SHUTTLE PROGRAM COST, PERFORMANCE, AND SCHEDULE REVIEW
Daniel E. Cassidy, Gerald E. Jenks, Thomas N. Tate, and Darrell R. Branscome Washington GPO 1979 84 p refs Rept. for the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 96th Congr., 1st Sess., Aug. 1979
(GPO-49-320) Avail: Subcomm. on Space Sci. and Applications

Testimony submitted by witnesses in response to Subcommittee reservations regarding the adequacy of the NASA funding request for fiscal year 1980 is summarized. The status of the space shuttle program is reviewed and a number of major issues are discussed. Recommendations for improving budget requrement estimating as well as program cost and schedule control are included. A.R.H.

N79-31826# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
MANAGERIAL PLAN: EXECUTIVE ORDER 12003 AND THE NATIONAL ENERGY ACT, PROPOSED, SYNOPSIS
Sep. 1978 18 p refs
(Contract EM-77-C-01-8962)
(DOE/TIC-10062) Avail: NTIS HC A02/MF A01

Upgrading the efficiency of all government buildings and operations to achieve sizable energy savings is considered. A managerial plan developed as a basic document to serve the needs of various levels of management is summarized. DOE

N79-31865# European Space Agency, Paris (France).
DEFINITION OF A EUROPEAN PROGRAM FOR EARTHQUAKE PREDICTION RESEARCH
T. D. Guyenne, ed. Apr. 1979 97 p refs Presented at ESA/Council of Europe Seminar, Strasbourg, 5-7 Mar. 1979
(SP-149) Avail: NTIS HC A05/MF A01

The-state-of-the-art concerning earthquake prediction is reviewed in a series of 16 lectures covering different fields, such as national programs for earthquake monitoring and prediction, space techniques in earthquake prediction research, error analysis of geodetically derived strains, real-time monitoring and data acquisition, and strain and tilt measurements in seismic areas.

N79-31867# United Nations Educational, Scientific and Cultural Organization, Paris (France).
EARTHQUAKE PREDICTION AND RISK MANAGEMENT
E. M. dAlbe *In* ESA Definition of a European Program for Earthquake Prediction Res. Apr. 1979 p 7-10

Avail: NTIS HC A05/MF A01

The practical aspects of earthquake prediction are situated within a general framework of safety management. It is noted that in order to reduce earthquake hazard not only a statement regarding the magnitude, location, and time of an expected earthquake is needed, but a knowledge of ground motion in the area surrounding the epicenter, possible damage to buildings, and potential loss of life or injury must be considered. It is proposed to define the risk, for decision making, as the product of value, vulnerability, and seismic hazard (probability of occurence of an earthquake within a given area and period of time). The assessment and eventual reduction of the risks are separately discussed. Author (ESA)

N79-31942# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
HUMAN FACTORS ASPECTS OF AIRCRAFT ACCIDENTS AND INCIDENTS
B. O. Hartman, ed. (School of Aerospace Medicine) Jun. 1979 95 p refs In ENGLISH and FRENCH Presented at the Aerospace Med. Panel Specialists' Meeting, Paris, 6-10 Nov. 1978
(AGARD-CP-254; ISBN-92-835-0241-8) Avail: NTIS HC A05/MF A01

A broad spectrum of aircraft accident areas and a number of different approaches to the problem are presented with emphasis on stress and its effects on the body, cognition, and the emotions.

N79-31943# Air Force Inspection and Safety Center, Norton AFB, Calif. Life Sciences Div.
THREE DECADES OF USAF EFFORTS TO REDUCE HUMAN ERROR ACCIDENTS, 1947-1977
Andrew F. Zeller *In* AGARD Human Factors Aspects of Aircraft Accidents and Incidents Jun. 1979 9 p

Avail: NTIS HC A05/MF A01

Thirty years after the formal inception of the USAF, major accidents had been reduced from 1,555 to 90. Human error associated with these accidents was reduced as much as material and other involvements. Analysis of the preventive efforts shows three distinct, although overlapping, approaches which have been employed. The administrative approach is the best known. This investigate-evaluate-fix cycle is the common dimension of almost all accident prevention effort. The scientific approach supplements the information by centering upon a systematic and intensive evaluation of human limitations in a defined man/machine setting. The third concept, total system management, emphasizes improvement in the management of the entire system, though the details of what will be instrumental in the prevention of a specific accident are often not defined. In practice, a viable accident prevention program incorporates all three approaches, with emphasis defined in relation to need. A.R.H.

N79-32016# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
DESIGN FOR AN AUTOMATED STATUS ACCOUNTING SYSTEM FOR SOFTWARE CONFIGURATION MANAGEMENT M.S. Thesis
Alexander Schuster Mar. 1979 244 p refs
(AD-A069300; AFIT/GCS/EE/79-2) Avail: NTIS HC A11/MF A01 CSCL 09/2

This report documents a design effort for an automated system to record and report the configuration status of software for Air Force embedded computer systems. The work included requirements analysis, software design, and data-base design. Because of the flexibility given to program managers in tailoring their reporting requirements and in selecting the data integrator, only the requirements of a single AFSC program office were presented in detail. However, the requirements of other offices were considered as well. Current software engineering techniques were used to derive the design. They are highly recommended for use on other software development projects. GRA

N79-32124*# California Univ., Livermore. Lawrence Livermore Lab.
AUTOMATING THE ANALYTICAL LABORATORIES SECTION, LEWIS RESEARCH CENTER, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION: A FEASIBILITY STUDY
W. G. Boyle and G. W. Barton 15 Mar. 1979 31 p Sponsored by NASA
(Contract W-7405-eng-48)
(NASA-CR-162183; UCRL-52594) Avail: NTIS HC A03/MF A01 CSCL 05A

The feasibility of computerized automation of the Analytical Laboratories Section at NASA's Lewis Research Center was considered. Since that laboratory's duties are not routine, the automation goals were set with that in mind. Four instruments were selected as the most likely automation candidates: an atomic absorption spectrophotometer, an emission spectrometer, an X-ray fluorescence spectrometer, and an X-ray diffraction unit. Two options for computer automation were described: a time-shared central computer and a system with microcomputers for each instrument connected to a central computer. A third option, presented for future planning, expands the microcomputer version. Costs and benefits for each option were considered. It was concluded that the microcomputer version best fits the goals and duties of the laboratory and that such an automted system is needed to meet the laboratory's future requirements. DOE

N79-32125* National Aeronautics and Space Administration, Washington, D. C.
NASA PATENT ABSTRACTS BIBLIOGRAPHY, A CONTINUING BIBLIOGRAPHY. SECTION 1: ABSTRACTS
Jul. 1979 88 p
(NASA-SP-7039(15)) Avail: NTIS HC E04 CSCL 05B

Abstracts are cited for 240 patents and applications for patents introduced into the NASA scientific system during the period of January 1979 through June 1979. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent. A.R.H.

N79-32126* National Aeronautics and Space Administration, Washington, D. C.
NASA PATENT ABSTRACTS BIBLIOGRAPHY, A CONTINUING BIBLIOGRAPHY. SECTION 2: INDEXES
Jul. 1979 635 p
(NASA-SP-7039(15)) Avail: NTIS HC E06 CSCL 05B

Entries for 3632 patents and patent applications for patent citations for the period May 1969 through 1979 are listed. Indexes for subject, inventor, source, number, and accession number are included. A.R.H.

N79-32127# Comptroller General of the United States, Washington, D.C.
DEPARTMENT OF ENERGY'S CONSOLIDATION OF INFORMATION PROCESSING ACTIVITIES NEEDS MORE ATTENTION
3 May 1978 53 p refs
(EMD-78-60) Avail: NTIS HC A04/MF A01

The house Committee on Government Operations asked GAO (Government Accounting Office) to review the Department of Energy's information processing activities. Several recommendations to the Secretary of Energy and to the Congress to improve management of information related activities by the Department of Energy are presented. G.Y.

N79-32131# Sandia Labs., Albuquerque, N. Mex.
PROBLEMS OF TECHNOLOGY TRANSFER TO INDUSTRY
1979 15 p refs Presented at the 6th Energy Technol. Conf. and Exposition, Washington, D.C., 26 Feb. 1979
(Contract EY-76-C-04-0789)
(SAND-79-0096; Conf-790213-1) Avail: NTIS HC A02/MF A01

The following are discussed: solar energy utilization, technology development, technology transfer, and problems with technology transfer. Examples of technology development and transfer to industry are given. DOE

N79-32138# Nebraska Univ. - Lincoln. College of Engineering and Technology.
THE DEVELOPMENT OF AN EVALUATION FRAMEWORK FOR TRANSPORTATION SYSTEM MANAGEMENT STRATEGIES Final Report, Aug. 1977 - 1978
Peter M. Lima, Patrick T. McCoy, and Steven R. Jepsen Aug. 1978 177 p refs Sponsored by DOT
(PB-295023/6; UMTA-NE-11-0001-79-1) Avail: NTIS HC A09/MF A01 CSCL 13B

A systems analytic approach was applied and six specific tasks were undertaken to construct a framework for: (1) the identification of specific transportation objectives which can be achieved through various TSM strategies; (2) the construction of a set of TSM performance measures or measures of effectiveness which are sensitive to TSM objectives; (3) the identification of a set of techniques to monitor the performance of TSM strategies; (4) the development of a decision rule which can be used to evaluate overall performance of TSM strategies; (5) the testing of monitoring techniques for various TSM strategies; and (6) the development of an information system for the collection, retention, and retrieval of TSM information. GRA

N79-32154# General Accounting Office, Washington, D. C.
CENTRALIZING AIR FORCE AIRCRAFT COMPONENT REPAIR IN THE FIELD CAN PROVIDE SIGNIFICANT SAVINGS
28 Mar. 1979 69 p Prepared by the Comptroller General
(PB-295320/6; LCD-79-409) Avail: NTIS HC A04/MF A01 CSCL 01C

A report to the Subcommittee on Defense, House Committee on Appropriations which explains how the Air Force can use its field component repair resources more efficiently and effectively by centralizing such repair among units with common aircraft is presented. GRA

N79-32196# Transportation Systems Center, Cambridge, Mass.
THE COSTS AND BENEFITS OF A MID-CONTINENT EXPANSION OF LORAN-C Final Report
R. L. Wiseman and C. M. Veronda Mar. 1979 177 p refs
(PB-294614/3; DOT-TSC-RSPA-79-3) Avail: NTIS HC A09/MF A01 CSCL 17G

The public benefits of a limited number of potential land applications of Loran-C are presented. GRA

N79-32251# Administrative Sciences Corp., Alexandria, Va.
NAVY AIR-LAUNCHED MISSILE OPERATING AND SUPPORT COST ESTIMATING MODEL
Paul T. Heilig Apr. 1979 196 p refs
(Contract N00014-77-C-0180)
(AD-A069527; ASC-R-118) Avail: NTIS HC A09/MF A01 CSCL 16/4

The Cost Analysis Improvement Group (CAIG), which is responsible for policy and guidance for cost analysis in the Department of Defense, issued a memorandum which contained an operating and support cost element structure (CES) for tactical air-launched missiles, to be used in all Defense System Acquisition Review Council reviews and other missile cost analyses. Accordingly, the Resource Analysis Group (Op-96D), which is responsible for independent cost analysis within the Navy, tasked Administrative Sciences Corporation to undertake a study. The CES which was developed contains sixteen cost elements which define and encompass the same activities described in the CAIG memorandum. Each cost element is discussed in detail in the body of this report. All pertinent data which was collected during the study is included, as well as examples of Navy documents which can be used for cost estimating in the future. Each source is identified by a point of contact and a DOD telephone number. All explanatory variables which were employed in the study, whether used in a cost-estimating relationship or not, are also included. GRA

N79-32410*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
TECHNICAL ASSISTANCE FOR LAW-ENFORCEMENT COMMUNICATIONS: CASE STUDY REPORT TWO
Norman B. Reilly and James A. Mustain 15 Aug. 1979 33 p refs Sponsored in part by LEAA
(Contract NAS7-100)
(NASA-CR-162294; JPL-Pub-79-78) Avail: NTIS HC A03/MF A01 CSCL 17B

Two case histories are presented. In one study the feasibility of consolidating dispatch center operations for small agencies is considered. System load measurements were taken and queueing analysis applied to determine numbers of personnel required for each separate agency and for a consolidated dispatch center. Functional requirements were developed and a cost model was designed to compare relative costs of various alternatives including continuation of the present system, consolidation of a manual system, and consolidated computer-aided dispatching. The second case history deals with the consideration of a multi-regional, intrastate radio frequency for improved interregional communications. Sample standards and specifications for radio equipment are provided. Author

N79-32411*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
TECHNICAL ASSISTANCE FOR LAW-ENFORCEMENT COMMUNICATIONS: GRANT SUMMARY
Norman B. Reilly 15 Aug. 1979 40 p refs Prepared for LEAA
(Contract NAS7-100)
(NASA-CR-162305; JPL-Pub-79-84) Avail: NTIS HC A03/MF A01 CSCL 17B

A summary overview of project activities and results are presented. The goals and objectives are reviewed and a description of the approaches used to attain them is given. The feedback received from the seminars conducted as part of the project, and results from a questionnaire about the project are included. Significant findings of the project in such areas as radio channel loading, dispatch system design, training and technology transfer are discussed. Several specific problem areas are identified and evaluated. Specific recommendations for future technical assistance efforts are presented along with an inventory of technical-assistance reports generated throughout the project. R.E.S.

N79-32677# Oak Ridge National Lab., Tenn.
DECENTRALIZED SOLAR ENERGY TECHNOLOGY ASSESSMENT PROGRAM: RESEARCH PLAN
B. H. Bronfman, M. Schweitzer, S. A. Carnes, E. Peelle, G. Samuels, Jr., and T. J. Wilbanks May 1979 53 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6913) Avail: NTIS HC A04/MF A01

The social, political, institutional and life-style impacts of the widespread adoption of decentralized solar technology are assessed. The major components are described and the research plan for the Technology Assessment Program is presented. Responsibilities, milestones and deliverables for all components are identified where applicable. DOE

N79-32725# Oak Ridge National Lab., Tenn.
PROPOSED INDUSTRIAL ENERGY DATA BASE FOR TECHNICAL EVALUATION OF ALTERNATIVE ENERGY SYSTEMS
Richard W. Barnes 1978 30 p Presented at the Workshop on Design of Ind. Energy Inform. Systems, Hilton Head Island, S. C., 6 Dec. 1978
(Contract W-7405-ENG-26)
(CONF-781244-1) Avail: NTIS HC A03/MF A01

Energy information required by industrial managers to make effective decisions concerning (1) management of energy use and supply, (2) introduction of new energy technology, and (3) conversion to new manufacturing processes is discussed. Energy accounting and auditing systems, significant technological and economic factors, and the pertinent external (to the industrial user) variables are also discussed. DOE

N79-32873 Carnegie-Mellon Univ., Pittsburgh, Pa.
ON THE EFFICIENT IMPLEMENTATION OF PRODUCTION SYSTEMS Ph.D. Thesis
Charles Lanny Forgy 1979 187 p
Avail: Univ. Microfilms Order No. 7919143

The algorithms used by a production system interpreter and the hardware on which the algorithms are executed are discussed. A detailed description is presented of a method for evaluating a set of patterns which (1) notes the similarities in the patterns so that it can avoid performing the same test more than once; (2) takes advantage of the fact that both the set of patterns and the set of objects change slowly by saving information from one evaluation to the next; and (3) allows a high degree of parallel activity during the evaluation. This method involves the use of a compiler which translates the patterns into a program for a virtual pattern-matching machine. It is shown that, although the instructions for this machine appear quite different from the instructions for a conventional processor, they can be interpreted efficiently on a conventional microprogrammed computer. If a microprogrammed computer were augmented with some inexpensive hardware described, it would be able to interpret the virtual machine instructions as fast as it interprets conventional instructions. Without the special hardware, the computer would interpret the virtual machine instructions about three times more slowly. Dissert. Abstr.

N79-33000# Atomic Energy of Canada Ltd., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
MANAGEMENT OF RADIOACTIVE FUEL WASTES: THE CANADIAN DISPOSAL PROGRAM
J. Boulton, ed. Oct. 1978 143 p refs
(AECL-6314) Avail: NTIS (US Sales Only) HC A07/MF A01; DOE Depository Libraries

The research and development program to verify and demonstrate the concepts for the safe, permanent disposal of radioactive fuel wastes from Canadian nuclear reactors is presented. The program is concentrating on deep underground disposal in hardrock formations. The nature of the radioactive wastes is described, and the options for storing, processing, packaging and disposing of them are outlined. The program to verify the proposed concept, select a suitable site and to build and operate a demonstration facility is described. DOE

N79-33098# General Accounting Office, Washington, D. C. Procurement and Systems Acquisition Div.
THE MULTINATIONAL F-16 AIRCRAFT PROGRAM: ITS PROGRESS AND CONCERN
25 Jun. 1979 43 p
(PB-296999/6; PSAD-79-63) Avail: NTIS HC A03/MF A01 CSCL 01C

The multinational F-16 aircraft program created complex tasks previously not present in acquiring U.S. aircraft. These include being able to meet the U.S. coproduction offset commitment, taking actions to keep the international production program on schedule, integrating U.S. procurement regulations and foreign operations, controlling currency exchange activity, and establishing a multinational reliability warranty program. To improve program management of the F-16 and future coproduction efforts, GAO recommends cost sharing of engineering changes, estimation of the cost impact of coproduction, and consistent loadings (overhead) allocation. GRA

N79-33111# East-West Gateway Coordinating Council, St. Louis, Mo.
TRANSPORTATION SYSTEMS MANAGEMENT ELEMENT Final Report
L. Sterman, S. Schold, and B. Ferris Mar. 1979 112 p refs Sponsored by DOT
(PB-295349/5; EWG-LS-0377.10.0; UMTA-MO-09-0014-79-1) Avail: NTIS HC A06/MF A01 CSCL 13B

Transportation Systems Management (TSM) denotes a process designed to increase the efficiency of existing transportation facilities and resources by implementing low-capital measures which reduce the need for major capital improvements. In addition to fiscal economy, the TSM process insures that meaningful steps can be taken toward attaining broader local and national goals, which include: energy conservation; environmental improvements; equity for transit dependents; and urban preservation. The TSM planning process in the St. Louis, Missouri region is documented. TSM goals and objectives, planning programs, projects and concepts, and project monitoring are included. GRA

N79-33113# Transportation Systems Center, Cambridge, Mass.
PROCEEDINGS OF THE 4TH US-GERMAN URBAN TRANSPORTATION WORKSHOP
Sep. 1978 342 p refs In ENGLISH; partly in GERMAN Workshop held at Los Angeles, San Francisco, and Chicago, 15-25 Apr. 1978 Sponsored by Urban Mass Transportation Admin.
(PB-294972/5; UMTA-MA-06-0086-78-1) Avail: NTIS HC A15/MF A01 CSCL 13B

The workshops are held in alternate years in the Federal Republic of Germany and the United States on the basis of international agreements between the Federal Ministry of Transportation, the Federal Ministry of Research and Technology, and the U. S. Department of Transportation. The purpose of the workshops is to share experience and research findings relative to policy, finance, planning, management, operations, and technologies in the field of urban transportation. GRA

N79-33151# Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e. V., Karlsruhe (West Germany). Inst. fuer Systemtechnik und Innovationsforschung.
PUBLISHED PATENT APPLICATIONS AND PATENTS RESULTING FROM GERMAN GOVERNMENT SPONSORED RESEARCH AND DEVELOPMENT Final Report
Gerhard Jaeckel and Ingrid Zierl Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 112 p In GERMAN; ENGLISH summary
(Contract BMFT-NT-0442)
(BMFT-FB-T-78-31) Avail: NTIS HC A06/MF A01; Fachinformationszentrum, Eggenstein-Leopoldshafen, West Ger. DM 23.55

The ministry for Research and Technology of the Federal Republic of Germany has sponsored research and development related to industrial innovations since 1969. Work reported on includes the published patent applications and patents from all projects which were sponsored up to and including 1974. Fields covered are electronics, optics, nonnuclear energy technology, applications of pure physics, materials development, and industrial processes technology. Author (ESA)

N79-33154# Perceptronics, Inc., Woodland Hills, Calif.
COMPARATIVE STUDIES OF ORGANIZATIONAL FACTORS, IN MILITARY MAINTENANCE Final Report
Kenneth L. Drake, William H. Crooks, and Russell N. Goto Jun. 1979 130 p refs
(Contract MDA903-77-C-0039; ARPA Order 3308)
(AD-A071608; PTR-1043-79-6) Avail: NTIS HC A07/MF A01 CSCL 01/3

This report describes the results of the second year effort of a two-year research program. The program was directed toward improving the capability of U.S. Army Aviation Maintenance Operations. The objectives of the overall program were to explore those organizational factors, emphasizing incentive structures, that influence aviation maintenance performance-effectiveness and efficiency. The current effort was directed toward performing a demonstration study based on one of the initial year's recommendations, which included the finding that it may be more profitable to reduce existing disincentives rather than produce additional incentives. One such disincentive was that of inefficient manpower scheduling for non-maintenance activities. A new scheduling system was experimentally tested with an operational U.S. Army Aviation Maintenance installation using an Organization Development intervention strategy. This system was a work pool approach and involved utilizing a small segment of the work force to perform taskings on a team rotational basis. Successful results were obtained in two major areas: (1) the reduction in primary MOS job interruptions; and (2) increased manpower control for work station supervisors. GRA

N79-33155# General Accounting Office, Washington, D. C. Logistics and Communications Div.
IF ARMY HELICOPTER MAINTENANCE IS TO BE READY FOR WARTIME, IT MUST BE MADE EFFICIENT AND EFFECTIVE IN PEACETIME
10 May 1979 54 p
(PB-295300/8; LCD-79-407) Avail: NTIS HC A04/MF A01 CSCL 01C

The improvement of the Army's 8,000 helicopters depot maintenance was considered. The realistic requirements were discussed along with the appropriate resources needed to meet them. It was concluded that the Army should apply the reliability centered maintenance-concept forming as long as it is economic, safe, and reliable for engine components. Depot effectiveness could be further improved if the Army reduced concurrent rework of aircraft components and made greater use of batch processing. GRA

N79-33202# Dynamics Research Corp., Wilmington, Mass.
DIGITAL AVIONICS INFORMATION SYSTEM (DAIS): TRAINING REQUIREMENTS ANALYSIS MODEL (TRAMOD), VOLUME 1 Final Report, Dec. 1977 - May 1978

Andrew J. Czuchry, Kristy M. Doyle, Jonahan T. Frueh, H. Anthony Baran, and Ducan L. Dieterly Apr. 1979 69 p refs
(Contract F33615-75-C-5218)
(AD-A068474; AFHRL-TR-78-58-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 05/9

The training requirements analysis model (TRAMOD) described in this report represents an important portion of the larger effort called the Digital Avionics Information System (DAIS) Life Cycle Cost (LCC) Study. TRAMOD is the second of three models that comprise a LCC impact modeling system for use in the early states of system development. As part of the overall modeling system, the training model is an efficient tool for developing training programs on the basis of task, time, and resource criteria. This report explains the approach used in developing this model and its analytic value as a method for determining training requirements. Also, the methodology used to develop the task-related characteristic data necessary for its application to the DAIS are addressed. The model is described by explaining the techniques and algorithms used to accomplish its function. The interactive nature of TRAMOD affords the user great flexibility in structuring its operation while retaining the capability of addressing specific training problems in depth. This report explains the basis for available options. The Users Guide, Volume II, presents these options and illustrates the manner in which user/model interaction is accomplished. GRA

N79-33242*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
POWER EXTENSION PACKAGE (PEP) SYSTEM DEFINITION EXTENSION, ORBITAL SERVICE MODULE SYSTEMS ANALYSIS STUDY. VOLUME 6: PEP PRODUCT ASSURANCE
Aug. 1979 27 p refs 12 Vol.
(Contract NAS9-15532)
(NASA-CR-160326; MDC-G7870-Vol-6) Avail: NTIS HC A03/MF A01 CSCL 22B

Safety, reliability and quality assurance design analysis results are presented as well as design requirements recommended for implementation in the PEP design. A.R.H.

N79-33243*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
POWER EXTENSION PACKAGE (PEP) SYSTEM DEFINITION EXTENSION, ORBITAL SERVICE MODULE SYSTEMS ANALYSIS STUDY. VOLUME 7: PEP LOGISTICS AND TRAINING PLAN REQUIREMENTS
Aug. 1979 20 p 12 Vol.
(Contract NAS9-15532)
(NASA-CR-160327; MDC-G7870-Vol-7) Avail: NTIS HC A02/MF A01 CSCL 22B

Recommendations for logistics activities and logistics planning are presented based on the assumption that a system prime contractor will perform logistics functions to support all program hardware and will implement a logistics system to include the planning and provision of products and services to assure cost effective coverage of the following: maintainability; maintenance; spares and supply support; fuels; pressurants and fluids; operations and maintenance documentation training; preservation, packaging and packing; transportation and handling; storage; and logistics management information reporting. The training courses, manpower, materials, and training aids required will be identified and implemented in a training program. A.R.H.

N79-33244*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif
POWER EXTENSION PACKAGE (PEP) SYSTEM DEFINITION EXTENSION, ORBITAL SERVICE MODULE SYSTEMS ANALYSIS STUDY. VOLUME 9: PEP DESIGN, DEVELOPMENT AND TEST PLANS
Aug. 1979 45 p 12 Vol.
(Contract NAS9-15532)
(NASA-CR-160328; MDC-G7870-Vol-9) Avail: NTIS HC A03/MF A01 CSCL 22B

A plan for the production of two PEP flight systems is defined. The task's milestones are described. Provisions for the development and assembly of new ground support equipment required for both testing and launch operations are included. A.R.H.

N79-33245*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
POWER EXTENSION PACKAGE (PEP) SYSTEM DEFINITION EXTENSION, ORBITAL SERVICE MODULE SYSTEMS ANALYSIS STUDY. VOLUME 10: PEP PROJECT PLAN
Aug. 1979 70 p 12 Vol.
(Contract NAS9-15532)
(NASA-CR-160329; MDC-G7870-Vol-10) Avail: NTIS HC A04/MF A01 CSCL 22B

Contents: project plan summary; project and mission objectives; related studies and technology support activities; technical summary; management; procurement approach; project definition items and schedule; resources; management review; controlled items; and safety, reliability, and quality assurance. A.R.H.

N79-33246*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
POWER EXTENSION PACKAGE (PEP) SYSTEM DEFINITION EXTENSION, ORBITAL SERVICE MODULE SYSTEMS ANALYSIS STUDY. VOLUME 11: PEP, COST, SCHEDULES, AND WORK BREAKDOWN STRUCTURE DICTIONARY
Aug. 1979 38 p 12 Vol.
(Contract NAS9-15532)
(NASA-CR-160330; MDC-G7870-Vol-11) Avail: NTIS HC A03/MF A01 CSCL 22B

Cost scheduling and funding data are presented for the reference design of the power extension package. Major schedule milestones are correlated with current Spacelab flight dates. Funding distributions provide for minimum expenditure during the first year of the project. A.R.H.

N79-33247*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
POWER EXTENSION PACKAGE (PEP) SYSTEM DEFINITION EXTENSION, ORBITAL SERVICE MODULE SYSTEMS ANALYSIS STUDY. VOLUME 12: PEP DATA ITEM DESCRIPTIONS
Aug. 1979 115 p 12 Vol.
(Contract NAS9-15532)
(NASA-CR-160331; MDC-G7870-Vol-12) Avail: NTIS HC A06/MF A01 CSCL 22B

Contractor information requirements necessary to support the power extension package project of the space shuttle program are specified for the following categories of data: project management; configuration management; systems engineering and test; manufacturing; reliability, quality assurance and safety; logistics; training; and operations. A.R.H.

N79-33334# Massachusetts Inst. of Tech., Cambridge. Center for Policy Alternatives.
PERFORMANCE EVALUATION OF MIT-INDUSTRY POLYMER PROCESSING PROGRAM
Richard M. Kutta and Robert T. Lund 30 Aug. 1978 198 p refs
(Grant NSF CG-0006)
(PB-296539/0; CPA-78-18; NSF/RA-780449) Avail: NTIS HC A09/MF A01 CSCL 05A

The current status of the program is evaluated with regard to financial viability, product commercialization, objectives and incentives and technology transfer. Recommendations are offered for future consideration by the Industrial Advisory Council of the PPP and by those interested in the development of other industrial-academic research collaboratives. GRA

N79-33391# Office of Science and Technology, Washington, D. C.
SUMMARY OF SURVEY ON THE FEDERAL ROLE IN

SATELLITE COMMUNICATIONS RESEARCH AND DEVELOPMENT
1 Jul. 1978 32 p
(PB-295949/2) Avail: NTIS HC A03/MF A01 CSCL 17B

Results of an OSTP staff survey on selected private industry firms and Federal agencies on the current state of affairs in satellite communications research and development are presented. Emphasis was given to developments within the U. S. satellite communications industry since the policy decision in 1972 which placed more reliance on the private sector and user consortiums for development of advanced satellite communications technology and services. Information and viewpoints useful for future policy development are given. GRA

N79-33607# Educational Facilities Labs., Inc., New York.
A REPORT ON THE DEVELOPMENT OF A MODEL ENERGY MANAGEMENT PROGRAM FOR NEW YORK STATE SCHOOLS, PHASE 2
Jul. 1978 144 p
(PB-295452/7; NYSERDA-78/7) Avail: NTIS HC A07/MF A01 CSCL 13A

Topic areas covered include: implementation of energy management programs; goals and elements of the plan; administrative organization; suggested activities and organizational strategies; incentive considerations; program cost estimates. GRA

N79-34006# General Accounting Office, Washington, D. C. Div. of Energy and Minerals.
FEDERAL FACILITIES FOR STORING SPENT NUCLEAR FUEL; ARE THEY NEEDED
27 Jun. 1979 42 p
(PB-297071/3; EMD-79-82) Avail: NTIS HC A03/MF A01 CSCL 18G

The question of whether commercial spent fuel is processed and how and where spent fuel is permanently stored is considered. GRA

N79-34074*# ESC Energy Corp., Daly City, Calif.
DISTRIBUTION AUTOMATION AND CONTROL SUPPORT; ANALYSIS AND INTERPRETATION OF DAC WORKING GROUP RESULTS FOR USE IN PROJECT PLANNING
Peter Klock and Dave Evans Apr. 1979 16 p
(Contract JPL-955231)
(NASA-CR-162331) Avail: NTIS HC A02/MF A01 CSCL 10B

The Executive Summary and Proceedings of the Working Group Meeting was analyzed to identify specific projects appropriate for Distribution Automation and Control DAC RD&D. Specific projects that should be undertaken in the DAC RD&D program were recommended. The projects are presented under broad categories of work selected based on ESC's interpretation of the results of the Working Group Meeting. Some of the projects are noted as utility industry projects. The ESC recommendations regarding program management are presented. Utility versus Government management responsibilities are noted. M.M.M.

N79-34075# Naval Postgraduate School, Monterey, Calif.
DECISION CRITERIA FOR COST-PLUS-AWARD-FEE CONTRACTS IN MAJOR SYSTEMS ACQUISITIONS M.S. Thesis
Gwilym Howard Jenkins, Jr. Mar. 1979 66 p refs
(AD-A070092) Avail: NTIS HC A04/MF A01 CSCL 05/1

The Cost-Plus-Award-Fee contract has useful application in Major Systems Acquisition during the full-scale development phase. This thesis examines the Cost-Plus-Award-Fee contract with Leavitt's Organizational Theory model which identifies goals, technology, people, structure, and environment as factors for analysis. It further investigates cost reimbursement contract types versus technical risk for identification of those criteria, which best accomodate application of the CPAF contract in major systems acquisition. This thesis concludes that the CPAF contract can be viewed as an informal management information system to enhance project control. It summarizes basic strengths and weaknesses of the CPAF contract in major systems acquisitions. GRA

N79-34076# National Technical Information Service, Springfield, Va.
DECISION MAKING IN MANAGEMENT. A BIBLIOGRAPHY WITH ABSTRACTS Report, 1970 - May 1979
Jack Jones Jul. 1979 327 p Supersedes NTIS/PS-78/0605; NTIS/PS-77/0580; NTIS/PS-76/0540; NTIS/PS-75/500 (NTIS/PS-79/0629/0; NTIS/PS-78/0605; NTIS/PS-77/0580; NTIS/PS-76/0540; NTIS/PS-75/500) Avail: NTIS HC $28.00/MF $28.00 CSCL 05A

Research on decision making is cited. Decision making aids and evaluations of criteria used in decision making are included, as are aids to decision making in various industries, research and development, and the military. Decision theoretic models are also covered. This updated bibliography contains 320 abstracts, 35 of which are new entries to the previous edition. GRA

N79-34077# General Accounting Office, Washington, D. C. Financial and General Management Studies Div.
GRANT AUDITING: A MAZE OF INCONSISTENCY, GAPS, AND DUPLICATION THAT NEEDS OVERHAULING
15 Jun. 1979 47 p refs
(PB-296981/4) Avail: NTIS HC A03/MF A01 CSCL 05A

An overhaul of Federal laws, policies, and agency practices to provide single, coordinated audit coverage of grant recipients is recommended to the Congress and the Office of Management and Budget, as well as to the executive branch which should improve coordination and assure that grant recipients are audited when necessary with results acceptable to all funding agencies. GRA

N79-34091# Oklahoma State Legislative Council, Oklahoma City.
DEVELOPMENT OF A SCIENCE AND TECHNOLOGY INFORMATION SYSTEM
James H. Johnson and Lee Ivy Mar. 1979 106 p ref
(Grant NSF ISP-77-25887)
(PB-297592/8) Avail: NTIS HC A06/MF A01 CSCL 05B

The activities of the Oklahoma Legislative Council to establish capabilities in the area of systematic transfer of scientific and technical information are described. Oklahoma is one of 42 states involved in the State, Science, Engineering, and Technology (SSET) program initiated to provide state policymakers with much of the best technical information possible to be used in the decision making process. The survey technique is used to obtain evaluations from a random sample of the legislature to assess its evaluation of the information resources available to them. Both needs and resource assessments are presented and include a series of models describing several types of information for the purpose of evaluation, a resource directory, flow charts, and an organizational chart. Questionnaires for needs assessment and resource assessment are contained in the appendices. GRA

N79-34093*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE ECONOMICS OF PROJECT ANALYSIS: OPTIMAL INVESTMENT CRITERIA AND METHODS OF STUDY
Marc C. Scriven (Alabama Univ., Huntsville) Sep. 1979 32 p refs
(NASA-TM-78242) Avail: NTIS HC A03/MF A01 CSCL 05C

Insight is provided toward the development of an optimal program for investment analysis of project proposals offering commercial potential and its components. This involves a critique of economic investment criteria viewed in relation to requirements of engineering economy analysis. An outline for a systems approach to project analysis is given Application of the Leontief input-output methodology to analysis of projects involving multiple processes and products is investigated. Effective application of

elements of neoclassical economic theory to investment analysis of project components is demonstrated. Patterns of both static and dynamic activity levels are incorporated. A.R.H.

N79-34095# Dynamic Sciences International, Sepulveda, Calif.
TEST PROGRAM SET COST ALGORITHM Final Report, 21 Sep. 1977 - Apr. 1978
D. James Zingg, Al V. Robertson, and Dave McIntyre May 1979 69 p
(Contract DAAB07-77-C-2727; DA Proj. 1I7-62779-AH-62)
(AD-A070629; CORADCOM-77-2727-F-1) Avail: NTIS HC A04/MF A01 CSCL 14/2

The Test Program Set Cost Algorithm provides a methodology for identifying and quantifying the funding costs of major tasks in Test Program Sets (TPS's) development. Areas that are addressed by the study include the learning curve effect, impact of ATE maturity, impact of UUT (Unit Under Test) Testability, effect of design guides on development and life-cycle costs, management-controlled cost factors, utilization of Automatic Test Program Generation (ATPG), development costs vs. life-cycle costs, fault insertion and customer 'sell-off', and commercial vs. military support. The basic algorithm deals with the analysis, coding, checkout and sell-off of a test program set but other factors such as overhead support, interface device design, ATE compatibility, etc., are discussed. The application and usage of the algorithm should provide a valuable estimating tool to assess costs associated with Test Program Set development. GRA

N79-34106# Harvard Univ., Cambridge, Mass. Landscape Architecture Research Office.
THE INTERACTION BETWEEN URBANIZATION AND LAND QUALITY AND QUANTITY IN ENVIRONMENTAL PLANNING AND DESIGN, THE PUBLIC EXPENDITURE MODEL, TECHNICAL DOCUMENTATION
John Kirlin and H. James Brown Jan. 1979 92 p refs
(Grant NSF ENV-72-03372)
(PB-294715/8; NSF/RA-780421) Avail: NTIS HC A05/MF A01 CSCL 13B

The impact of land use change upon public local expenditures was investigated. The public expenditure model simulates local fiscal decision making and estimates operating expenditures and capital outlays for a number of separate local public service categories. The model accepts information about changes in ppopulation, employment, and the demographic characteristics of the town from the various allocation models. This information, combined with a variety of descriptive information about the town at the beginning of the iteration, provides the basis for public decisions about the size and composition of the local budget. These budgetary decisions serve as inputs to public allocative models such as schools and local conservation. GRA

N79-34110# Voorhees (Alan M.) and Associates, Inc., McLean, Va.
TSM (TRANSPORTATION SYSTEM MANAGEMENT): AN ASSESSMENT OF IMPACTS
Fred A. Wagner, Keith Gilbert, Steven Shapiro, James E. Watt, and William S. Herald Nov. 1978 188 p refs
(PB-294986/5; UMTA-VA-06-0047-79-1) Avail: NTIS HC A09/MF A01 CSCL 13B

Urban areas with populations greater than 50,000 are required to develop TSM plans that document their strategy for improving air quality, conserving energy, and increasing the efficiency of the overall transportation system. Interim results of research designed to quantify the impacts of TSM actions on the system are summarized. Working papers are included which describe experience with and the impacts of ridesharing, routes and scheduling, Park-and-Ride and express bus, work rescheduling, and auto restricted zones. GRA

N79-34117# Midwest Research Inst., Kansas City, Mo.
TECHNOLOGY ASSESSMENT IN THE PRIVATE SECTOR: AN EXPLORATORY STUDY
James D. Maloney, Jr., Mary Simister, and Daniel Keyes 30 Nov. 1978 228 p refs
(Grant NSF ERS-77-13028)
(PB-297047/3; NSF/PRA-7713028) Avail: NTIS HC A11/MF A01 CSCL 05A

The limitations of past studies undertaken to investigate the relationship of technology assessment to private sector planning are examined and the need for additional research is discussed. Objectives and hyptheses of the study were translated into survey questions and the methodology for the sample selection and survey administration is presented. Industrial technology assessment is defined and differentiated from other types of assessment efforts in the private sector. The quantitative results of the survey and their relationships to the research questions/hypotheses/objectives are reviewed. GRA

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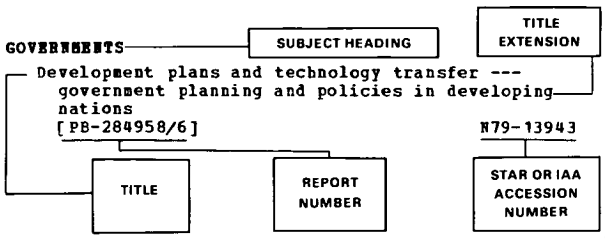

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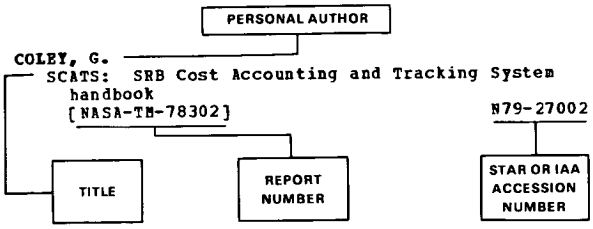

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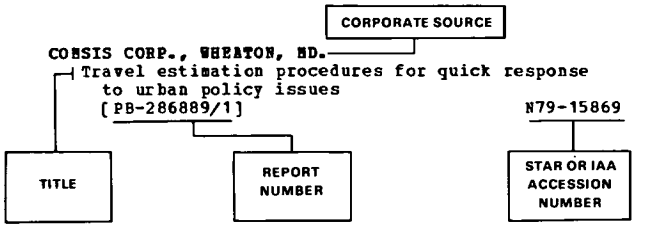

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